HE CHEMICAL AGE

OL LVI 15 FEBRUARY 1947 No 1442

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INDEX TO ADVERTISERS
IN THIS ISSUE


NAPHTHALENE
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STAVELEY
XYLOL
STAVELEY
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STAVELEY
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STAVELEY
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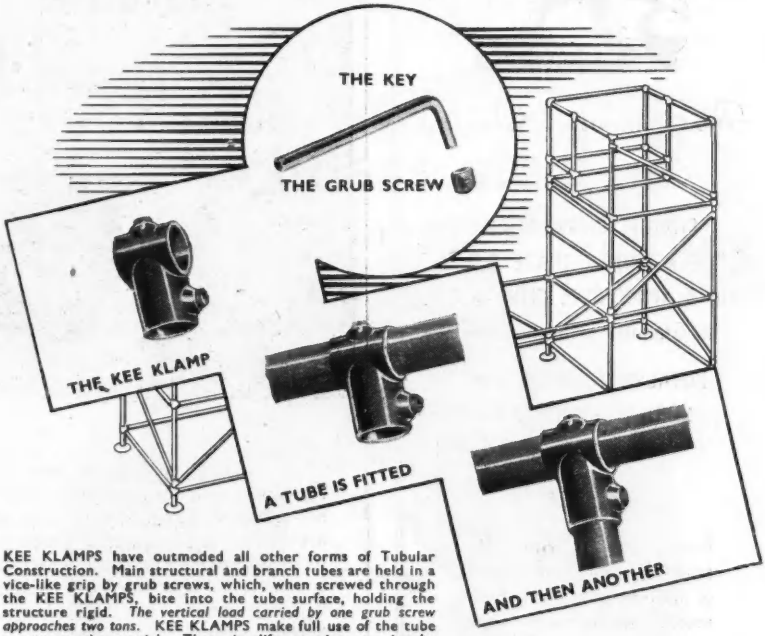

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Industrial Paralysis

FOR weeks past we have seen the wheels of industry grinding slowly to a standstill. At the time of writing there is the threat that the whole of the country will be involved in the great power shut-down.

The severe weather of January and early February has brought in its train an economic blizzard the like of which has never been known in this country. Its effects will be felt for a very long time. In many unpleasant ways in the next months and perhaps years we shall feel the aftermath of the big fuel famine, from continuing and even worsening shortages of food and other essentials down to deteriorated travelling conditions.

The seriousness of the position began to be brought home to many people weeks back. From out of the blue, firms announced they would have to close their works owing to lack of coal. Hasty improvisation in some cases provided for small supplies to be rushed to the affected firms. But these proved unequal to the task of filling the empty bunkers. Then the allocations scheme was announced by which it was hoped that most industries were to receive at least a proportion of the fuel they needed. But the allocation quota in many cases was not maintained. Dozens of firms had to put their workers on short time, or even shut down altogether. Thousands of people were thrown out of work.

Then came more and more electricity and gas cuts. Finally, after three weeks of wintry weather during which transport of coal was brought to a standstill, came the news that over half the country, including most of the big industrial areas, would be asked to deprive themselves of all electric current for five hours a day. Only certain industries were to be exempt. In effect it meant the closure of a large proportion of the industries of this country, including many engaged almost exclusively in the manufacture of goods for export. During the first day of the cut it was estimated by one Minister that there would be four million unemployed as a result. And all this for want of a few thousand tons of coal which should have gone to the electricity companies' reserves during the summer months.

There is a jingle which goes—For want of a nail a shoe was lost; for want of a shoe a horse was lost; for want of a horse a kingdom was lost. The present situation could be summed up by paraphrasing this: For want of thought, coal was lost; for want of coal, power was lost; for want of power . . . . well we don't know at the moment just what this will lead to.

Looking back over

On Other Pages

Our Next Issue

Following a conference between the Ministry of Fuel and Power and the Periodical Proprietors' Association on Monday afternoon, it was agreed that trade and technical periodicals dated up to February 15 should be produced and issued as, in many cases, the printing of these journals was well advanced. After February 15 the production of these journals is to be suspended for at least two consecutive issues.

THE CHEMICAL AGE will not, therefore, be published in the coming fortnight and the next issue will be in readers' hands, if all goes well, on Saturday, March 8.

the events leading up to the crisis it is ironic to reflect that it was Mr. Shinwell himself who had at his finger tips the figures which could have told him what was going to happen. In fact an elementary schoolboy could have deduced a crisis from them. The figures which Mr. Shinwell gave in Parliament in July were these. Estimated total production of coal for the succeeding 12 months 185.9 million tons; consumption, 196.2 million tons. Reserves in hand, 8.9 million tons—to meet a deficit of 10.3 million tons. These figures clearly indicated the depletion of our coal stocks at a rapid rate. This is what happened, until the reserves stood at a dangerously low level. Along came the winter weather —a little more severe than usual, but not entirely unexpected at this time of the year —to hold up the movement of coal, and the gamble which the government had taken had failed. Industry had to stop.

It is a depressing thought that thousands of trucks filled with coal are standing by the collieries unable to be moved to areas where coal is urgently needed. It is even more depressing to realise that coal production may actually be stopped in some places because of this accumulation of coal in the wrong place.

The story of the effects of the electricity cut on industry is told on another page: they do not on the surface appear to affect the chemical industry to the extent that the coal cuts have done. The power cut itself is in many cases voluntary, and individuals, especially householders, have been put on their honour not to use electricity during the shut-down hours. Writing this two days after the beginning of the great cut, we can say that on the whole people have been scrupulous in their observance of the government's request. It was a wise move on the part of the government not to enforce penalties for breaches of the request to switch off electricity. The people of Britain have sense enough to know that it is to their eventual benefit to save electricity now and allow the generating stations a breathing spell so as to build up coal reserves again. After months of coal shortages, reduction of gas and electricity cuts they have co-operated willingly with the government in an endeavour to save the country from complete paralysis of industry. The government should note this fact and not hesitate in future to take the country into its confidence no matter how dismal the story they have to tell.

We do wonder, however, if the government has done everything possible to save power. Mr. Attlee himself gave as one of the contributory causes the abandonment of double summer time. Why not reintroduce it this summer if by so doing power is saved? And why not immediately introduce ordinary summer time? Never mind what the cows think about it. The only criterion should be, will it save fuel? Among other steps the government could take is an examination of the claim by a fuel expert recently that he had a scheme by which millions of tons of coal could be saved. We are admittedly improvising now as best as we can to get ourselves out of the present mess; but we have to look forward to next winter and scheme and struggle so as to avoid a similar or even worse power breakdown then.

Authority is now being granted for a range of small scale imports to Great Britain from Finland under the Token Imports scheme. Applications to import must be accompanied by a Token Shipment Voucher specifying a supplier in Finland and made to the Import Licensing Department, 189 Regent Street, London, W.1.

NOTES AND COMMENTS

SCIENTIFIC MAN-POWER

TWO interesting booklets published by the Parliamentary and Scientific Committee have reached us this week. One is the Annual Report for 1946 and the other is on "Universities and the Increase of Scientific Man-Power." The former gives a list of the peers and M.P.s who are members of the committee as well as the scientific and technical organisations represented on it. The second booklet examines the recommendations of the Barlow Committee which came to the conclusion that the number of qualified scientists in this country (now about 55,000) should be increased to at least 90,000 by 1955. The Parliamentary and Scientific Committee points out that this figure could only be nearly approached if government help is forthcoming on a bold and generous scale without delay and the highest priorities given for the man-power and materials required for building the increased accommodation that the universities' expansion involves. It examines the Barlow figure very carefully and comes to the conclusion that if the output of science graduates from the universities were doubled by 1955 it would be ten years before we had got to the 90,000 target. It comes to the conclusion, therefore, that "even the most energetic efforts made to double the student population cannot provide anything like the number of scientists likely to be needed by 1955. If it were possible to double the output by 1950 and then to go on to treble it by 1960 calculations show that we should still not have reached the total of 90,000 until 1959."

SHORTAGE OF LECTURERS

TO increase the output from the universities the number of teachers will have to be raised from the present 4000 to 8000-10,000. This is not going to be easy. It truly remarks that men who were just starting research in 1939 who might have entered the universities as teachers have now probably reached positions of high rank outside the universities with salaries of £1000 a year or more. These men are not likely to be attracted by the normal starting salary of an assistant university lecturer of between £350 and £400 a year. So that this source from which university teachers might have been drawn is probably now closed. The second main source is from the honours graduates of this and subsequent years and the committee thinks there is a possibility that by their recruitment of new graduates university staffs could be doubled by 1949 to 1950. The committee examined the question of the cost to the country that this enlargement of our scientific strength would involve. They estimate the cost of buildings for accommodation will be something of the order of £45,000,000, and new laboratories £40,000,000, plus the cost of equipment. The universities had provisionally estimated that they would be involved in a capital expenditure of some £45,000,000 during the next decade, but the recommendations of this committee will involve an expenditure of something in the region of a £100,000,000. The committee hopes to send a deputation to the Chancellor of the Exchequer to discuss this report and the possibility of action being taken as soon as possible.

1951 EXHIBITION

HISTORY repeated itself in the hall of the Royal Society of Arts last week, when a widely representative gathering assembled for the conference called by the Society to sound public opinion regarding the proposed 1951 International Exhibition in Hyde Park. It was in that same hall, a century ago, that similar gatherings took place prior to the world's first international exhibition. The 1851 Exhibition had the personal and active patronage of the Prince Consort, who was president of the then Society of Arts; and if the ghost of his Royal Highness was abroad last week it heard the august name frequently invoked in support of the 1951 project. Though no decision was taken at the conference, it amply fulfilled its object of eliciting varied and authoritative points of view, for 135 organisations covering virtually every phase of our national life had accepted the invitation to send a delegate. Lord Bennett, the Society's president, was in the chair, and Lord Samuel, as chairman of the sub-committee concerned, gave the project his blessing. Opinion among the delegates, however, was divided—not on the principle of holding such an exhibition at the earliest possible date, for that was generally endorsed, but on the practica-

bility of holding it so soon as 1951 and on the desirability of Hyde Park as the site. The over-riding objection in many minds seemed to be the inevitable diversion of labour and materials from more immediately essential projects. Clearly this is a point on which public opinion would need to be reassured if the nation's goodwill were to be rallied behind the enterprise. The optimism of certain delegates, notably Mr. A. C. Bossom, M.P., that by 1951 the housing crisis will have passed and that in any case new alternative building materials will by then be available was not widely shared. It seems to us doubtful whether even Mr. Bevan would commit himself to a prophesy as to what the position will in fact be four years hence. But we feel that, if Britain is ever to throw off the "safety first" complex which seems to have descended upon it with the peace, there must be a revival of bold and imaginative ventures such as a great international exhibition, which would focus the eyes of the world upon Britain and things British. Let us count a few bricks and a few bricklayers well lost against the vast and incalculable gain in prestige and goodwill that must result from such an enterprise.

AFRICAN OIL SCHEME

THE Government decision to establish, with the co-operation in the preliminary stages of the United Africa Company, a series of groundnut plantations over a vast area of East Africa and Northern Rhodesia will commend itself to the great majority in this country as one of the first signs that the administration has the vision to deal very practically with a pressing shortage on a scale commensurate with the need. Almost equally reassuring evidence that the Government is ready to deal realistically with the problem created by the great shortage of edible oils is the news that the work of clearing some of the territory to be planted has already begun. This £24 million scheme for over three million acres of Africa is one of the largest enterprises of its kind on record, and a measure of its urgency is the statement that the estimated production three or four years hence of more tha.. 600,000 tons of groundnuts annually will be sufficient to supply no more than one-third of Britain's yearly deficiency. Primarily, the scheme is, of course, intended to serve the needs of the food industry, but there are several good reasons why the enterprise will have the good wishes of the chemical and allied industries. Not the least is the prospect that the opening up of these vast and largely untapped areas and the provision of road and dock facilities will ultimately encourage a flow of other commodities more immediately useful to the chemical industry. And, above all, when production reaches full scale the inflated prices recently announced for several categories of vegetable oil must return to more reasonable levels and the consequent demand for several other types of oil will be partially diverted. The announcement of the African scheme will certainly not rank as good news in Argentina.

BRAKE ON ENTERPRISE

THE characteristic of a nightmare with which most people are acquainted—in which one strives to run but only crawls with leaden feet—seems to sum up the kind of experience which has been common to executives in industry almost since the initiation of the peace time prosperity drive, and has tinged that campaign with more than a suspicion of irony. The extent to which the prevailing "deficiency disease" in industry, of which the present coal shortage is the most sinister and debilitating manifestation, is limiting output in factories otherwise well equipped with the plant, labour and determination to supply the pressing need for maximum output of goods for the home and export trades is reflected in the very factual review of "The Struggle for Production" in the *Manchester Guardian*—written before the present electricity stortage. The investigators have cast their net wide to span representatives of nearly all the light and heavy industries and the tale—of plant and men slowed or idle for lack of one or two components or raw materials—has been almost uniformly the same. The far-reaching effects of one shortage such as steel, drained by priority housing demands, is another adverse factor, holding up engineering shops at one end of the production chain and at the other halting exports of chemicals by withholding steel drums. This is only one of the many examples cited by the review of the effects partly of world shortages but more immediately of failure to reach an equilibrium between the supplying industries and their dependents. The *Manchester Guardian's* data seem irrefutable and the situation seems fraught with disastrous possibilities.

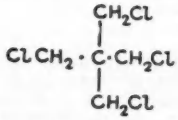
A New Notation for Organic Chemistry

by GUY G. S. DUTTON, B.A., A.R.I.C.

IN view of the recent remarks in this paper (THE CHEMICAL AGE, January 4, 1927) concerning the difficulties of keeping abreast of the multitude of scientific publications which appear at the present day a proposed new notation for organic chemistry is indeed a welcome idea. The essentials of this new notation were given by the originator, Dr. Malcolm Dyson, F.R.I.C., at a joint meeting of the Chemical Society, The Royal Institute of Chemistry, The Society of Chemical Industry, and the Bureau of Abstracts in London on October 21, 1946. The text of this lecture has just been published by the Royal Institute of Chemistry in monograph form and the following is a precis of some of the more fundamental ideas involved.

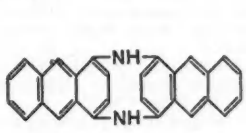
Difficult Formulæ

Dr. Dyson started his lecture by giving some illustrations of the difficulty of applying the rules of the Geneva Congress of 1892 to the naming a certain organic molecules. Several examples of names in the Ring Index which are " unspeakable " and are not convenient as written references were given. Such rings are numbers 3179, 3681 and 3669, the last of which is named Dinaphtho [2,1-c,1',2'-e] [2,7] benzodioxecin and even a simple structure such as the following :

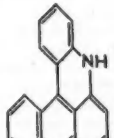


is described by Beilstein as : 1,3, 2',2'-Tetrachloro-2,2 dimethyl propane.

One way out of the difficulty of these " unspeakable " formulæ is to allot to each parent compound a trivial name as indeed has been done in the compilation of the Ring Index. This method has obvious advantages in a laboratory or factory where certain chemicals are in everyday use, but for the purpose of nomenclature a more absolute method should be chosen. One of the dangers of indexing compounds according to their trivial name is that several technically correct names may be allotted to the same compound, and unless an elaborate system of cross referencing is employed the existance of such a compound may be missed in searching the literature. This danger is increased when the official name by which a compound is indexed changes in the course of time as has happened, for instance, with the Chemical Abstracts. Some examples of the substances which are normally indexed according to their trivial names are as under :

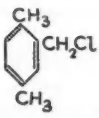


Anthraparazene



Ceramidine

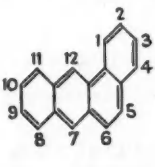
while even

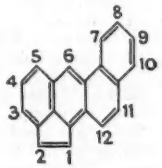


2'-Chloro-1,2,4-trimethyl-benzene
2'-Chloroψcumol
2,5-Dimethylbenzyl chloride
1,4-Dimethyl-2-chloromethyl benzene

can have four names as shown.

One of the main troubles with compounds containing fused rings is that there is no generally accepted method for their enumeration, different methods having been adopted in this country, the U.S.A., and Germany. Even the Ring Index is not consistent because in benzanthracene (No. 2805, Ring Index) arbitary enumeration is as under, but when an extra ring is added in





positions 7-8 (No. 3174, Ring Index) the original pattern of enumeration is discarded and a new one started.

The New Notation

The general purpose of the new notation may be summarised as :

1. To provide a unique linear expression delineating the full structure of an organic compound irrespective of its complexity.

2. To provide this linear equivalent in a form that is convenient for indexing and has a unique and unequivocal enumeration.

3. To maintain certain mathematical implications in the cipher so that mechanical manipulation, sorting, selecting, and

the summation of empirical formulæ can be effected by suitable machines.

The symbols used are the letters of the alphabet (using Θ in place of O to avoid confusion with zero), the numerals, parentheses (), brackets [], the stroke /, stop ., comma ,, semicolon ;, hyphen -, and the sign of a series . . . . Thus, the alkaloid papaverine is ciphered K.2LN.C.[4B.1,2QC].6,7QC.

In ciphering any given compound the following rules must be adhered to:

1. The cipher is divided into sections marked off by a stop; each section is *an operation* (*e.g.*, 2ZN).

2. A number following a symbol without the interposition of a comma or stop is a *modulant*, as in "B3" or "N2."

3. A number immediately preceding a symbol is referred to as a *locant*, as for example, in "2ZN" or "6,7QC"; in the second example both 6 and 7 are locants.

In order to illustrate the method of use of the new notation some representatives of different classes of compounds are considered below.

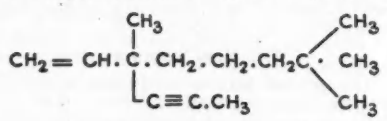
Hydrocarbons

As in the Geneva Convention saturated acyclic hydrocarbons are ciphered according to the longest chain present in the molecule. Thus, C3 is propane and C10 decane. Branched chains are ciphered in terms of the longest chain, the branches being added in subsequent operations, the longest first, since all additions to the main chain are added in order of decreasing size. Where two or more substituents are attached to the same carbon atom the locants of their positions are separated by commas.

Unsaturation is indicated by the letter E with modulants as under:

E Ordinary double bond.
E1 Double bond with *cis*—arrangement of groups.
E2 Double bond with *trans*—arrangement of groups.
E3 Triple bond.

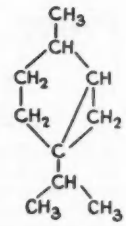
Thus, pentene-1 is C5.E and C4.1,3E is butadiene. These points are illustrated in the following formula and it is to be noted that



C9.4C2.4,8,8C.10E.2E3

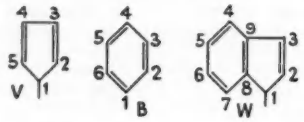
E operations come after the skeleton of the molecule has been delineated and that they are ciphered in order of their modulants.

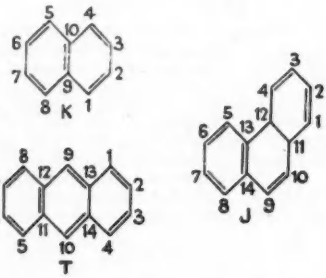
To signify that a ring has been formed the symbol "A" is used. Thus, AC6 is *cyclo*hexane and thujane, whose formula is



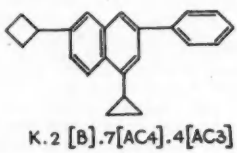
is ciphered as AC6.1-3A.C2.4,7C while its systematic name is 1-isopropyl-4-methylbicyclo 3.1.0 hexane.

All aromatic rings are related to the six conventional rings set out below:





This means that toluene is ciphered as B.C; *sym*-triethylbenzene is B.1,3,5C2 and 5-methyl-4-ethyl-1-butyl phenanthrene is J.C4.4C2.5C. As in Beilstein, rings are cited in order of seniority T,J,K,W,B,V,AC and subsidiary rings have their symbols enclosed in brackets to indicate that enumeration begins afresh for each such symbol enclosed thus:



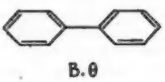
K.2 [B].7[AC4].4[AC3]

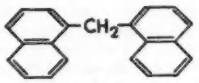
In order to indicate hydrogenation of a ring the symbol H is used, as in J.9,10H for 9,10-dihydrophenanthrene, but if the ring is completely hydrogenated then H precedes the symbol for that ring, *e.g.*, HT for tetradecahydroanthracene. Partially hydrogen-

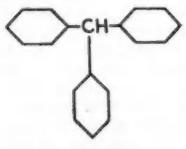
ated rings can be ciphered either by the introduction of an E operation into the fully hydrogenated ring or by a separate operation in H with the aromatic ring thus: HJ.9E and J.9.10H.

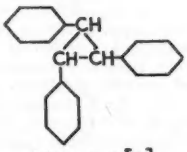
As there are many common fused ring compounds of greater complexity than the standard rings listed above it is convenient to have a series of modulated forms of T,J,K and W. Thus, benzanthracene, considered to be derived from T and not the junior J is known as T1. A list of such common modulants is given in the appendix to the lecture.

Where a hydrocarbon comprises two or more identical rings either joined directly or through a single carbon atom, Θ is used to indicate duplication; 3Θ, triplication; 4Θ, quadriplication, and so on. Thus:


B.Θ


K.ΘC.


B.3ΘC


AC3.1,2,3[B]

Two types of heterocyclic compound are recognised, those delineated by substitution and by adduction. The first class, by far the larger, is ciphered by adding operations in ZQ,ZS,ZN, etc., these symbols standing for hetero-oxygen, sulphur, nitrogen, respectively. These operations follow the symbol for the corresponding homogeneous ring as in:

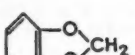

B.ZN


V1.ZQ


W1.ZS.3ZN

Where half or more of the adduct is heterogeneous the cipher is formed by carrying out a sequential operation as in:


K.1-8AQS


B.1-2AQCQ

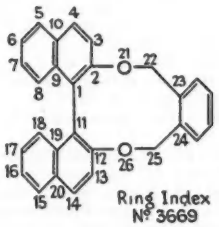
Since Q is used for oxygen this gives Q for hydroxyl, EQ for carbonyl, and X is used for carboxyl. The use of these symbols enables all alcohols, glycols, aldehydes, ketones, acids, and substances comprising any or all of such groups together to be ciphered completely. It is to be noted that ethers and esters are ciphered from the side containing the larger hydrocarbon residue, thus:

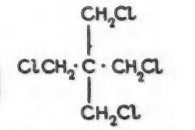
CH_3CH_2OH or C2.Q; $HOOC.CH_2.CH_2.COOH$ or C4.1,4X; $CH_2CH_2COOC_2H_5$ or C3.X[C2]; $CH_3COOC_2H_7$ or C3.[XC2]

and it will be observed that when an ester is ciphered from the acid side, X is *outside* the square bracket, but when from the alcohol side X is *inside* the bracket which serves to distinguish the two modes of treatment.

In order to cover the various functional groups containing nitrogen, seven modulated forms (N,N1-6) are used, *e.g.*, N,amino; N4,azo. A similar series exists for S.) By using these and the foregoing principles a complex molecule such as Dianisidine Blue, whose formula is given overleaf, is readily ciphered as shown.

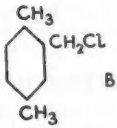
The simplicity of this notation, which can be applied to any compound, is particularly well illustrated when used to cipher the "unspeakable" compounds mentioned at the beginning:


Ring Index No 3669


C3.2,2C.1,3,4,5CL

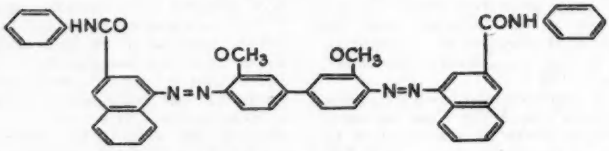
K.Θ.2-12B6.23-24B4.21,26ZQ.21,26H

while the compound with four trivial names is ciphered simply and unambiguously as under:


B.1,2,4C.8CL.

In order to test the validity of the new notation Dr. Dyson has ciphered the Ring Index which presented no special difficulty. Of the 3970 rings cited, over 90 per cent could be ciphered in less than 20 symbols, while on an average the corresponding names used 45 terms. Further proof of the general applicability of the method was furnished by a detailed application to certain groups of compounds such as carbohydrates and purines.

In view of the mathematical implication in the cipher it is possible to punch a card



Dianisidine Blue

3,3'-Dimethoxy-4,4'-bis(3"-naphthalenecarboxyanilide-1"-azo)diphenyl

B. 8. 4, 10 N 4 [K. 3CEQ [N.B.]]. 3, 9Q C.

so that it gives a complete record of the structure of a compound. Special machines exist into which a pack of such punched cards can be fed and which will carry out of the following operations:

1. Sort out from the pack all structures with a given characteristic, *i.e.*, all *cyclo*-hexane derivatives or all pyridine derivatives. This enables a whole series of cards to be classified speedily and easily.

2. The machine will also print on a roll of paper all the ciphers corresponding to the pack of punched cards fed into the sensing unit.

3. Literature references can also be punched into the card, and printed with the cipher in a similar fashion.

4. Physical properties can be similarly recorded—and the machines will give a complete list of such categories as, say:

i. All compounds with a recorded m.p. between 200-220 C.

ii. All substances of which the dielectric constant is known.

The answers to these questions come in the form of printed lists of ciphers, themselves arranged in correct indexing order.

One of the greatest drawbacks to chemists in general is that there exists at the present day no up-to-date record of all organic compounds known. The most complete list at present available is in Beilstein but this only goes up to 1920 which leaves a gap of 27 years, during which time a great deal of work has been published, with no other references than the Collectives Indexes. By means of these punched cards the vast amount of data existing in Beilstein and the Abstract and Zentralblatt literature can be collated in a fraction of the time that it would take to do manually. It is in this way that the material for a new "Lexicon of Organic Chemistry" will be prepared and steps have already been taken to begin this task. Dr. Dyson said it was hoped that by 1954 a complete survey will be available of the literature up to 1950 and that by 1957 the New Lexicon should only be a few months behind the wave front of current publications.

It is to be hoped that this is not an over-optimistic forecast, for when the new Lexicon is available most of the routine drudgery of to-day's literature searching will be eliminated. For this Dr. Dyson will earn the grateful thanks of all organic chemists for although any new system of nomenclature must seem strange, if not complicated, at first sight, the fact that the number of symbols used has been reduced to a minimum enables this new notation to be readily understood.

(Further details of this notation are to be found in a monograph by Dr. Dyson published by Messrs. Longmans and entitled "A New Notation and Enumeration System for Organic Compounds," at present in press.)

HYDROGEN PEROXIDE WORKS

As briefly announced last week, B. Laporte, Ltd., chemical manufacturers, Luton, are to erect additional plant for the manufacture of hydrogen peroxide and peroxy compounds on a 16-acre site at Lower Walton, Warrington, alongside the Manchester Ship Canal.

The firm now informs us that, in addition to the works site, it has purchased the Baronet Farmhouse, which has recently been modernised and will be occupied by the resident engineer, and about 15 acres of land which may be utilised as a housing estate for technical staff and other employees. The plant to be installed will embody the results of intensive research and long experience at the firm's works at Luton. All strengths of hydrogen peroxide will be manufactured, up to 90 per cent by weight. A large and constant flow of cold water will be necessary, and this has been practically assured from test borings made on the site.

Hydrogen peroxide and peroxy compounds are used extensively in the textile and other industries in the North of England, Scotland and Northern Ireland; consequently, Warrington is regarded as a good centre for distribution in the home market.

Non-Ferrous Metals

Substantial Rise in use of Zinc and Tin

A SUBSTANTIAL rise in the U.K. consumption of some non-ferrous metals—zinc and tin—in the last quarter of 1946 and a continuing reduction in the use of lead, cadmium and antimony are recorded by the Ministry of Supply. Consumption of virgin zinc rose in the October-December period from 53,865 tons to 60,023 tons; of tin from 6593 to 7143 tons. Reduced consumptions were lead, from 45,913 to 44,154 tons; cadmium, from 144 to 131 tons; and antimony, from 1529 to 1344 tons. Total consumption of virgin zinc in 1946 was 216,089 tons, and of tin 25,606 tons. Scrap zinc, including remelted metal, supplied a further 73,275 tons.

Of the total consumption of zinc 72,166 tons was absorbed by galvanising and 55,373 tons in the production of zinc oxide. Of the total supply of 317,195 tons of lead in 1946, 193,506 tons was imported lead and 123,689 tons were recovered from scrap. Of the total consumption of 33,244 tons of tin (virgin and scrap) 14,055 tons was employed in alloys and 7331 tons in the production of tinplate. Solder was the third largest consumer of tin, 6646 tons of it. Of the year's supply of cadmium, 542 tons, 211 tons were used in plating and 158 tons in the production of colours. The total of 5623 tons of new antimony provided 2590 tons for the production of oxides and compounds and 1300 tons for electric battery production. There were in addition 3199 tons produced from scrap.

Digest of Statistics

Declining Exports in December

INCREASED imports and diminished exports of non-ferrous metals in December and a general decline in the production of chemicals in November as compared with the previous month are tendencies revealed by the January issue of the *Digest of Statistics* (H.M.S.O., 2s. 6d. net). In the external trading field, imports rose in the November-December period in the case of bauxite from 7.8 to 23.7 (thousand tons); aluminium from 8.87 to 15.08; and copper from 28.9 to 32.3. Tin ore and lead imports diminished, after a substantial increase in October, tin from 6.1 to 2.4 and lead from 20.6 to 12.1 in December.

In the same group, tin blocks, etc., were the only item to register increased exports, from 4.4 in November to 20.3 in December. The opposite tendency was marked in the exports of metal and manufactures of aluminium (from 87.8 to 57.0), brass (123.3 to 98.0) and copper (117.4 to 93.2).

Oil from Africa

Government Sponsors Vast Groundnut Scheme

THE largest single scheme for raising production within the Commonwealth of vegetable oil is described in detail in a Government "Blue Book" just issued by H.M. Stationery Office, coinciding with the announcement in the House of Commons that preparatory work in Africa has now begun.

The scheme proposes to cultivate over 3,210,000 acres in Tanganyika, Northern Rhodesia and Kenya by the establishment of 107 fully mechanised plantations of groundnuts, each of 30,000 acres. This will involve a total capital expenditure of some £24 million, provided out of Government funds and spread over six years. The scheme will be operated under British Government supervision by the newly formed United Africa Company (Managing Agency), a subsidiary of the United Africa Company, with Mr. F. Samuel as its managing director. The United Africa Company will act until a permanent corporation is established by statute.

The whole purpose of the scheme is to alleviate the British—and world—shortage of groundnuts, which in Britain alone is stated to be equivalent to 1,500,000 tons a year, and aims to produce by scientific cultural methods 600,000 tons of groundnuts by 1950-51, rising to an annual production of 800,000 tons. Thus, in the early stages, the new plantations are unlikely to supply more than one-third of Britain's annual deficiency. On the basis of an average yield of 850 lb. per acre, production costs are likely to require a selling price for groundnuts of £14 5s. 6d. per ton f.o.b., against the figure of approximately £32 per ton now current in world markets.

Although the scheme is designed predominantly to aid British food industries—and is capable of saving £10 million annually of Britain's food bill—it is likely in time to afford relief, directly or indirectly, to all oil-consuming industries.

Chemical Plant Available

Pressure oxidation plants for the production of nitric acid ammonia are among the variety of chemical and industrial plant which the Ministry of Supply is seeking to dispose of as surplus to Government requirements. Other items being offered include a wide variety of furnaces for gas, oil or electricity, distilling, degreasing, electroplating and chemical plant and oil purifiers, forges and heat-treatment plant, magnetic crack-detecting apparatus and ventilating equipment. Full details are available from the Directorate of Disposals (M), D (M1), Great Westminster House, Horseferry Road, London, S.W.1.

POWER CUTS CLOSE FACTORIES

Light Industries are Hardest Hit

REPORTS of the effects of the cutting off of electricity supplies in 26 counties and parts of 12 others on Monday indicated, when THE CHEMICAL AGE went to press, that activities of the chemical and metal industries, already greatly reduced by the coal shortage, would not be further hampered to quite the same extent as some of the light industries, where operations ceased.

Owing to the suddenness with which the cuts came into operation the full effects have not been easy to ascertain. Typical of large-scale industry in the " blackout " area, however, was the Alkali Division of I.C.I., employing 7000 at Northwich, Cheshire, where production early this week was virtually at a standstill. The General Chemicals Division of the company, located in the Liverpool area, were subject to the same conditions. Most of the Metals Division, excepting those works where continuous processes could not be stopped without serious damage, was also on a minimum scale of operation, and the Billingham works, although outside the area of the stoppage, had previously been reduced to 30 per cent production by coal shortage. Among the few exceptions was the I.C.I. Explosives Division located largely in Scotland. The I.C.I. Salt Division, using its own power, was running satisfactorily; at two Dyestuffs and Drugs factories 760 were idle.

Some Carry On

In the metal industries, those concerned with non-ferrous metals seemed likely to suffer more from the effect of the " switch-off " than the iron and steel industry.

The latter, classed as an essential industry, early this week was not so greatly affected by the electricity cut, although some of the small firms using public supplies of electricity for heat treatment found their processes suspended.

At the iron and steel works at Workington, where much of the power is steam, and where 1500 men are employed, the blast furnace men will lose 14 hours, and the steel workers 24 hours per week. At the Mersey Iron Works, Ellesmere Port, dependent on the Mersey Power Company for current, production has stopped until supplies are restored. Burnell's Iron Works, Ellesmere Port, which generates a portion of its own power, will be affected only to a limited extent, and work commenced on February 10, the management hoping to carry on with a smaller supply of power which they receive from the grid. Rotherham Corporation gas-works, on February 5, had to cut off gas supplies to a number of important steel firms and others.

Among other industries classed as essential were gasworks and coke ovens supplying them, oil-seed crushing and refining, margarine and cooking fats, essential medical supplies and soap.

Wide variation in the hardships imposed by the cut characterised the various reports from chemical and associated industries, according to the extent to which they were dependent upon main electricity supplies for the continuance of operations. An official of Pilkington Brothers, Ltd., the St. Helens glass manufacturers, said: "We can see no alternative to an extensive restriction of glass production from Monday (February 10), which will put many hundreds out of employment." Some of the small plants of Joseph Crossfield and Sons, Warrington, have closed down, but there will not be any unemployment as the workmen have been transferred to other productions. At Runcorn, the chemical works are equipped with their own generating plant, but two out of four tanneries closed down last week-end for three or four days, involving between 400 and 500 workers. Alderman Edwin Thompson, of Thompson and Capper (Wholesale), Ltd., Speke, manufacturing chemists, said on Monday that owing to the ill-timing of the notice it had been impossible to tell their 300 employees that they were closing down until Wednesday morning. " All will turn up this morning only to be told to go back home," he added.

Effects in the North West

In some North Wales areas industrial consumers received no electricity except where discontinuation would endanger plant. The Monsanto chemical works at Cefn Mawr, Ruabon, had to close five departments on Saturday last owing to a shortage of fuel, making a total of ten departments which closed during the week, and further departments may be closed. The rayon works of Courtaulds, Ltd., at Flint and Holywell, generate their own electricity. At the Stanlow Oil Refineries, where the largest number of people in Ellesmere Port and district are employed, there is no interruption of work, as the industry is scheduled as essential. Widnes Foundry Company's works, where 400 men are employed, stopped production at the end of last week, but all the employees were given jobs about the works.

Metropolitan Vickers, Trafford Park, Manchester, closed except for workers in the foundries and steel products. The English Steel Corporation, North Street Works, Man-

chester, closed on Monday, throwing 2500 men temporarily out of work. Power to Bury industries was not cut off, manufacturers being asked to enter into a "gentleman's agreement" to restrict demands to essential services.

In the North-West there are 2,500,000 registered workers, and Mr. George Gibson, chairman of the North-West Regional Board for Industry, on the eve of the cuts urged a general closing of 14,000 firms for the week.

Plants Closed

Other evidences of the general slowing or cessation of industrial production were reports of the partial closure of I.C.I. (Paints) and Longley Alloys at Slough, 4000 employees given notice at the General Electric Company, Coventry; the complete closing, excepting the Rugby Works, of British Thomson-Houston; and the halt in production at the Triplex Safety Glass Works at Willesden and Birmingham. Most of the mills in the Lancashire cotton districts have been idle this week, in Royton only one mill in 20 being at work on Monday. In a 20-mile area around Birmingham it was estimated that a million workers were unemployed through electricity or coal shortages and at Coventry it was estimated nearly 70,000 had received notices to end their employment.

The Nuffield organisation states that a week's notice will be given to all workpeople if electricity supplies are not restored by Monday next; the Dunlop Rubber Company has cancelled plans to re-start work halted by the coal shortage. Most electrical equipment works in the affected areas, such as the Ferranti Electrical Works, near Manchester, have now closed, and in Sheffield most steel and engineering firms, notably Hadfield's, Ltd., have been obliged to close owing to the combined effects of the coal shortage and the withholding of power current. Fortunate exceptions to the general rule are the Brush Electrical Equipment Co., at Loughborough, and its associate Mirlees, Bickerton and Day, of Stockport, both of which have adapted the diesel engines which they manufacture to provide their own electric power.

According to a statement issued by the National Union of Manufacturers almost all the 4000 firms represented in their Association are closed down.

Addendum

THE article from our New York correspondent under the heading "G.E.C. Review of 1946" which appeared in our issue of February 1, referred, as was indicated by its origin, to the General Electric Company of Schenectady, New York, U.S.A., and not to the General Electric Company Ltd. of this country

Chrome Ore Prices

Official Schedule

THE Ministry of Supply announces the following prices for chrome ore as from February 1, 1947. The Ministry endeavours to deliver ex-ship wherever possible, but cannot accept orders on this basis.

Refractory Grades	Per ton Ex. ship £ s. d.	Per ton Ex. store £ s. d.
Rhodesian Imperial Grade ...	9 17 6	10 15 0
Transvaal 1st. Grade ...	8 2 6	9 0 0
Sierra Leone	9 10 0	10 7 6
Philippine	9 0 0	9 17 6
Indian	9 2 6	10 0 0
Metallurgical Grades		
Rhodesian Washed Concentrates	10 0 0	10 17 6
Rhodesian Lumpy Metallurgical	10 0 0	10 17 6
Baluchistan	10 0 0	10 17 6
Chemical Grades		
Rhodesian Dyke Chemical ...	10 0 0	10 17 6
Transvaal Chemical Concentrates	10 2 6	11 0 0
Transvaal "A" Grade ...	9 12 6	10 10 0
Baluchistan	10 0 0	10 17 6
Indian	9 17 6	10 15 0

THE HOUSE OF BENN

There was a record attendance of about 340—nearly 100 more than last year—at the annual staff dinner given by the directors of Benn Brothers Ltd., (proprietors of THE CHEMICAL AGE), and Ernest Benn, Ltd., at Grosvenor House, Park Lane, London, W.1., on February 7. The guests were received by Mr. Glanvill Benn (chairman, Benn Brothers Ltd.) and Mrs. Glanvill Benn, Sir Ernest and Lady Benn, and Mr. John Benn (chairman, Ernest Benn, Ltd.).

Mr. Glanvill Benn presided at dinner and among those present was Lord Stansgate.

The toast of "The Firm" was proposed by Mr. J. K. Lewis, (manager of the firm's Midlands office), and Commander A. O. Gillett, R.N. (director), replied.

Reference to the fact that the occasion was the biggest Benn gathering ever held was made by Mr. Norman French (managing director), in proposing the toast of "The Staff." Since the dinner last year, he said, more employees had returned from the Forces and, in addition, there were close upon 90 newcomers. Such a remarkable change in personnel had not been foreseen two years ago

The toast of "The Chairman" was proposed, and in reply, the chairman said the secret of happiness was not to do as one liked, but to like what one did.

Sir Ernest Benn, who was called upon to speak, amid cheers, in typically happy vein congratulated the present board in selecting the right type of entrant to the firm.

Sulphuric Acid

Supply and Consumption in 1946

THE production and disposal of sulphuric acid and oleum supplies in Great Britain in 1946 and in the last three months of the year are issued and analysed in returns prepared by the National Sulphuric Acid Association. Figures provided indicate a small, general reduction in stocks of chamber and contact types (from 68,048 tons at the beginning of the year to 66,163 tons on December 31) and a similar small decline in raw materials, with the exception of spent oxide, of which nearly 18,000 tons more were available at the end of 1946. Analysis of consumption shows that the production of superphosphates absorbed the largest share of the production (450,109 tons) and sulphate of ammonia, rayon and paper and iron and tinplate pickling were the next largest consumers. The principal data for the whole of 1946 are contained in the accompanying tables:

SULPHURIC ACID AND OLEUM SUPPLY

	Chamber only	Contact only	Chamber and Contact
	Tons of 100% H_2SO_4		
Stock 1 Jan., 1946 ...	38,547	29,501	68,048
Production	721,585	657,609	1,379,194
Receipts	161,401	102,484	263,885
Oleum Feed ...	—	8,588	8,588
Adjustments ...	—109	+3,085	+2,976
Use	441,279	285,980	727,259
Despatches	441,954	487,315	929,269
Stock 31 Dec., 1946	38,191	27,972	66,163
Total capacity ...	882,180	756,430	1,638,610
Percentage production ...	81.8%	86.9%	84.2%

RAW MATERIALS

	Pyrites*	Spent Oxide	Sulphur and H_2S	Zinc Concentrates
Stock 1 Jan., 1946 ...	86,253	130,299	32,391	54,585
Receipts ...	283,793*	223,162	198,219	154,460
Adjustments ...	+2,219	+4,195	+1,193	+4,134
Use	312,697*	191,346	202,051	163,195
Despatches ...	3,133	17,106	1,189	581
	126†	1,122†		
Stock 31 Dec., 1946 ...	56,309	148,082	28,563	49,403

* Including anhydrite "converted to pyrites."
† Used at works for other purposes.

SULPHURIC ACID AND OLEUM—CONSUMPTION

UNITED KINGDOM AND EIRE

Trade Uses	Tons 100% H_2SO_4
Accumulators	8,698
Agricultural purposes	7,291
Bichromate and chromic acid	8,216
Bromine	9,327
Clays (fuller's earth, etc.)	6,583
Copper pickling	2,387
Dealers	13,622
Drugs and fine chemicals	10,791
Dyestuffs and intermediates	59,377
Explosives	12,723
Export	2,212
Glue, gelatine and size	356
Hydrochloric acid	55,714
Hydrofluoric acid	3,117
Iron pickling (incl. tin plate)	73,570
Leather	4,863
Metal extraction	822
Oil (mineral) refining	29,962
Oil (vegetable) refining	6,954
Oxalic, tartaric and citric acids	7,196
Paint and lithopone	60,933
Paper, etc.	3,114
Phosphates (industrial)	3,850
Plastics, not otherwise classified	16,435
Rare earths	8,455
Rayon and transparent paper	110,361
Sewage	8,812
Soap and glycerine	2,959
Sugar refining	658
Sulphate of ammonia	232,854
Sulphate of barium	3,813
Sulphate of copper	25,348
Sulphate of magnesium	9,247
Sulphate of zinc	2,155
Superphosphates	450,109
Tar and benzole	13,968
Textile uses	18,614
Unclassified—(Borax and boracic acid, chlorsulphonic acid, formic acid, sulphate of alumina, etc.)	72,154
Uses unknown	29,744
TOTAL	1,397,364

New Research Company

A new company, Esso Development Co., has been formed to take over the existing Esso European laboratories and to carry on and expand their work for the benefit of associated companies throughout Europe. Shareholders of the company, which is registered in England, with an authorised capital of £200,000, are the Anglo-American Oil Company and Standard Oil Development Company, the research organisation in the U.S. of the Standard Oil Company of New Jersey.

The new organisation will work in collaboration with Government Departments and British scientific bodies.

Plastic Pouring Jug

A plastic pouring jug for use in laboratories, process rooms and everywhere where acids and organic solvents are used, has been introduced by United Ebonite and Lorival, Ltd. Cast in Lorival "A," a pale yellow phenolic resin, this jug is light in weight, free from crevices, and impervious to most of the mineral acids; as it is non-metallic, a spark cannot be accidentally produced. It is claimed it can be used with confidence for acids even at temperatures up to 100°C., and for many organic solvents. It costs 26s. 6d.

Hard Materials

Increased Use of Diamond Substitutes

THE use of hard materials, such as diamonds, carbides, various forms of corundum (alumina), etc., for tools, abrasives and for many other industrial purposes has increased considerably in recent years and their nature and properties and applications form the subject of intensive research in many countries. Since industrial diamonds have been in short supply for some years the search for substitutes both in the direction of synthesising other gems nearly as hard (*e.g.*, sapphires) and in the preparation of metallic carbides has been greatly stimulated.

During the war, the percentage of the world's total output of diamonds utilised in industry was increased to about 80 per cent, as compared with a pre-war percentage of about 50. A vast reserve for industrial uses also was accumulated in Canada and by 1942 had reached a total of no less than 12,000,000 carats. Most of this has now been returned through the Board of Trade (London) to the various producers or owners of the diamonds in Britain, Belgium, Portugal and elsewhere. Imports into the U.S.A. for similar purposes also increased nearly fourfold in 1940 (nearly 4 million carats), compared with 1936 (1.1 million carats). But total world production of diamonds has declined from 12.5 million carats in 1939 to 9.1 million in 1942, the heaviest fall being in South African; so that, despite the largely increased share devoted to industry during the war—a high percentage which may not be maintained if the gem trade has its way, there is still a serious shortage.

Improved Sapphires

Although the diamond, as the hardest known substance, is often indispensable, somewhat less hard substances can on occasion be employed. For this reason synthetic sapphires have lately come more prominently into the picture. An interesting survey of the work done by the General Electric Co., Ltd., in this country was given by Mr. H. P. Rooksby, of the research staff at Wembley, in a paper read before the Royal Society of Arts, April 3, 1946, which was recently published in the *Journal* of the R.S.A. The method employed is that of Verneuil, introduced about 1902 and little changed since. Synthetic sapphires for some time have also been manufactured in the U.S.A., especially in the cylindrical form as distinct from the spherical or boule type originally made by Verneuil. Among recent improvements in the process is that of preparing a more readily flowing alumina or corundum powder from which the sapphire crystals are formed. In a recent British patent (B.P. 563636) the G.E.C. describe a method of production from hydrated aluminium sulphate or ammonium alum by firing this in silica trays at 1000° C. for about two hours. The charge swells up to a spongy form of anhydrous alumina which is broken down to fine powder by tumbling.

Another interesting and promising line of search is that of metallic carbides for tool tips, etc., in connection with which work was in hand in France and elsewhere just before the war and has been continued since. The Renault firm, for example, at Billancourt has recently taken out, or applied for, several patents in France and other countries covering various developments. Among these may be mentioned, first, the use of much higher pressures than was hitherto customary. In the manufacture of tungsten carbide, for example, by sintering in a graphite crucible at high temperature and reducing with hydrogen, they have used pressures up to 6000 kg/cm², as compared with the 50-100 kg. commonly employed. This has reduced both the time and temperature of sintering, namely to 1600° C. for half an hour for complete reaction and a homogeneous product.

Another improvement claimed is the elimination of impurities when using the ordinary type of cast steel ball mill for grinding. Impurities due to excessive wear on the mill, in the usual method of making these carbides, such as tungsten carbide with which a certain proportion of cobalt is added as binder or matrix, may be eliminated by treatment with hydrochloric acid or metallic chlorides, followed by evaporation and reduction with hydrogen. It is pointed out, in this connection, that the current method of coating the carbide powder with a malleable metal of the iron-cobalt-nickel group is expensive and complicated, requiring something like 50 hours and liable to serious trouble through impurities, incompleteness of coating, etc. The new methods claim to obviate all this.

Matrix Improvement

It is further claimed that the addition of a certain amount of iron to the cobalt considerably improves the binder or matrix. Addition of not more than 7 per cent iron ensures a cubic rather than a hexagonal structure in the mixed crystals, together with a maximum of ductility and minimum of wear; and, what is more important, it is possible to work at lower temperatures. By way of example: grains of hard material are coated with a concentrated solution of cobalt-iron chloride in a proportion to give 7 per cent iron after reduction by hydrogen

at 500°C. Compression is then applied at approximately room temperature, followed by any required shaping with appropriate heat treatment. In another example the ground carbide is mixed with cobalt chloride or the mixed cobalt-iron chloride. Thus 55 g. cobalt and 4.13 g. pure iron are converted into chloride with hydrochloric acid, excess acid being evaporated, and to the hot aqueous solution of mixed chloride is added 940.87 g. of finely ground tungsten carbide containing 5.75 per cent carbon. The resulting suspension is heated and constantly stirred until a dry powdery mass is obtained which may be further pulverised if necessary. The product is then reduced in hydrogen for about 6 hours at 500°C., compressed when nearly cold, and reheated to about 1400°C.

Another French company in this field is Le Carbone Lorraine, of Paris, who have recently tested the effect of including zirconium and other comparatively rare elements in their carbides. As an improvement on zirconium carbide alone they propose either the double carbide of zirconium and tungsten or a mixture of this double carbide with that of titanium and tungsten. These are prepared from their respective suitable compounds, e.g., oxides, heated up to about 2300°C., in a reducing atmosphere, and gradually cooled, using cobalt, or cobalt with a little iron, as binder. Other carbides or elements may be incorporated, including vanadium or tantalum, as well as chromium, in order, among other things, to limit grain size and thus increase density.

Production of High Octane Spirit with Aluminium Chloride Catalyst

FOUR chemical engineers from the Shell Development Company, Emeryville, California, addressing over 1400 members of the American Institute of Chemical Engineers at its 38th annual meeting held in Chicago recently, revealed that a shortage of high octane petrol during the war was prevented by the invention of a new catalytic process to make needed chemicals. The four men, S. H. McAllister, W. E. Ross, H. E. Randlett, and G. J. Carlson, discussed for the first time their work in perfecting the new catalytic method which involved the changing of butane into isobutane.

Because of the increase in demand for special type petroleum products, experiments were carried out to change straight-chain petroleum products to branched-chain compounds. Butane had to be changed into iso-butane by isomerisation.

"From earlier laboratory studies," the speakers said, "anhydrous aluminium chloride was known to possess considerable catalytic activity for hydrocarbon isomerisation at low temperatures." The problem was to translate this reaction into a commercially feasible process and the difficulties which had to be overcome were great. If the chemical reaction was to be carried out in a gaseous state, the catalyst, aluminum chloride, vaporised and solidified in other portions of the apparatus where it blocked flow. If the reaction was carried out in a liquid state, the solubility of the catalyst was not great enough. "One solution to these problems," said the speakers, "was the development by the Shell Companies of a vapour-phase process for butane isomerisation, using aluminum chloride impregnated on a bauxite carrier."

The process was immediately put into widespread commercial application but experimental work was continued on the liquid process and soon this too was brought to a successful conclusion. The best catalyst the speakers reported for use in the new process was aluminum chloride dissolved in antimony chloride together with hydrogen chloride. The new process is said to have a constant high conversion with attendant low catalyst consumption. At the present time a number of commercial plants are in successful operation and manufacturing both of these materials.

SWEDISH TRADE REGULATIONS

The following chemicals and manufactures are included in the latest list published by the Board of Trade of goods for which an import licence from the Swedish State Trade Commission is required on export to Sweden: Chromic, boric and tartaric acids; tartrates of metals or ammonium; salicylic acid esters; casein; sodium salicylate; acetylsalicylic acid, its salts and esters; quinine bases, their salts and other derivatives; paraffin wax; calcined soda; vitamin A oils; salts of salicylic acid with alkaline bases; quebracho extracts; white lead; lithopone; linseed oil and other oil varnishes. Licences from the State Food Commission are required for the export to Sweden of oil seeds, phosphorite, ammonium sulphate, common salt, soap, soft soap and soap substitutes, substances containing fat, oil, resin, wax or soap and fertilisers.

MANAGEMENT PROBLEMS

In order to assist subscribers in the solution of their management problems we invite questions relating to such matters as accounting, costing, control of plant and materials, office methods, income tax, etc. Correspondents will be answered under initials but should give their names and addresses, which will no tbe published, and when documents of any kind are sent to us they should be copies only, as they cannot be returned. Letters should be addressed to the Editor.

Depreciation and Taxation

Query.—" Last year we installed a number of new motors designed to withstand the corrosive atmosphere in our works, and sold all the old units as scrap. The amount of capital expenditure involved in the new acquisitions was in the neighbourhood of £750, which amount was dealt with in our books by transferring the invoiced items from the purchases journal to the debit side of the private ledger account. This increased the balance of the latter to £1060; since when we have received a total of £192 cash on sale of the old units. Would it be possible for you to make up a specimen account, and to inform us as to how the matter stands from the viewpoint of taxation."—P. & T.

Reply.—The sum realised on sale of the old motors should be deducted from the book value to determine the amount to be charged against profits for purposes of taxation, the asset account being made up as shown below:—

Credit

	£
By Cash (Sale of old motors) ...	192
By Transfer to Profit and Loss (Balance of old motors written off)	118
To Balance (new motors) ...	750
	£1,060

Debit

	£
To Balance (old motors)	310
To Cost of New Motors	750
	£1,060
To Balance	750

Both initial and annual allowances can be claimed, the former being at the rate of 20 per cent, and the latter based on the book value of the motors after deducting the amount of the initial allowance.

Petty Cash Routine

Query.—" I have been in the habit of allocating from £8 to £12 each month to meet petty expenditure on postages, paper liners, laboratory glass, etc., but would like to adopt a better method, as these small items add up to a considerable sum in the course of the year."—S.R.K.

Reply.—There are several ways of dealing with petty cash, and probably the best is that known as the " imprest " system. An estimate should be made of the first month's expenditure, and a round sum withdrawn from the bank, sufficient to cover the total and to leave a small margin. This amount will be recorded on the payments side of the general cash book in the usual way and should be entered on the debit side of a petty cash book. This book can be ruled with as many money columns as are needed to classify the expenditure under fixed heads, each amount paid away being entered first in a " total " column on the expenditure side and then into its appropriate analytical column. At the end of the month or other convenient period, the total of the disbursements should be ascertained by adding the figures shown in the " total " column, another cheque being then made out, this time for an amount exactly equal to that total. This would leave the original round sum still in hand, or imprest, and similar methods should be adopted at the close of each subsequent month or period.

Rejections

Query.—" In our case we find that the number of factory rejections is gradually increasing, and we must take steps to find the value of these rejected products, as any material increase above the present level would mean a revision of prices of products in process. Could you draft a suitable style of rejection slip or report?"—M.B.

Reply.—Some of the larger organisations use a style of rejection note giving the process or job number, the quantity of products inspected and the number rejected, with the reasons for the rejects. These forms are usually issued to the process departments by the inspection department. Losses arising from rejected work can often be controlled by the submission of weekly reports.

Time Cards

Query.—" Some of our workmen seem to think it great fun to stab their cards into the clock when registering on and off, with the result that the figures often get into the wrong place. Can you suggest anything to overcome this?"—J. & T.

Reply.—Human nature being what it is, it is advisable to use cards that stamp clearly and accurately, and a good test as to the make of card can be applied by pressing the edge with the thumb nail.

HOLLAND'S RISING PRODUCTION—SIGNS OF RECOVERY IN GERMANY

INCREASING activity by nearly all chemical undertakings in Holland is the object of recent widespread capital expansion. Following capital increases by the Royal Dutch, the Chemische Fabriek, of Naarden, Sulphuric Acid, Ltd., Ketjen, and the paper and chemicals producing company of Messrs. Van Gelder & Sons, Ltd., have offered a new public issue of shares. All these firms have good orders on hand, not only from Dutch consumers but also from abroad. The Naarden undertaking is a well-known producer of a wide range of essences, of theobromine, etc.; the Ketjen company is profiting by the present urgent need for sulphuric acid by superphosphate makers and many other consumers, and is aided by the relatively liberal Government-sponsored imports of pyrites from Spain and elsewhere. The contact sulphuric acid factory of Ketjen will double its capacity this year and intends to export acid. Next year also a new plant for liquid sulphurous acid (*zwaveligznur*) will come into commission. The Ketjen company also makes saccharine, at present greatly in demand, and proposes to devote even more attention to this. Its production of potassium permanganate is now so large that it expects to have a disposable surplus.

Dutch Experts Optimistic

The position of the chemical industry in the country generally is being judged optimistically by experts. Its vital rôle in an economy of rehabilitation is widely acknowledged, and this and the prospect that it will become a source of foreign currency assures it of public support.

It is announced that 150,000 metric tons of bauxite are ready for shipment from the Riouw Islands (East Indies), where Dutch control is not contested. Under the auspices of the Hague Government, expert consultations are going on to ascertain whether processing of bauxite may prove a paying proposition in Holland itself. So far, the aluminium rolling mill at Utrecht, which was put in commission some months ago, is wholly dependent on foreign deliveries of sheets and rods.

Another potent factor at the moment derives from the recent Dutch-Russian agreement, under which Holland is to receive 30,000 metric tons of 40 per cent potash salts and 23,000 tons of 26 per cent potash salts, the latter being used especially as a fertiliser for potatoes. These deliveries will be made from the Russian occupied zone of Germany. The quantity of potash salts is, however, inadequate, constituting only some 13 per cent of Holland's needs. Deliveries from Holland will consist of 20,000 tons of superphosphate and 60,000 barrels of herring. The rectification of German boundaries, on which Holland insists, is another means of augmenting the potash supply from that source.

It is characteristic of the present transport difficulties that this barter trade is taking place *via* the harbour of Lubeck to the exclusion of the formerly efficient German canals, this representing a reversion to the custom of the Middle Ages.

Increasing representations from Holland for the rehabilitation of the German chemical and metal industries are foreshadowed by the statement in London by Dr. Hirschfield, Netherlands Government Commissioner for German Affairs, to deputies of the Foreign Ministers that, while Holland was in favour of re-establishing only peaceful industries in Germany, his country felt the production of the German chemical and metal industries should not be restricted more than was essential for security purposes. Simultaneously, it has been announced that the first foreign trade pact between industrial Western Germany and a foreign country—Holland—has been effected by Anglo-U.S. Military Government representatives and the Government at the Hague. The meetings at which the pact was approved also resulted in contracts for importation by the Dutch of nearly £250,000 worth of dyestuffs and other materials. The Deputy Director, U.S. Military Economic Division, said similar agreements would follow with other nations desiring to revive their German trade.

Facilities for British Businessmen

Facilities are now being provided for 60 British businessmen a month to visit Western Germany and study British-owned factories and agencies to assess their prospects of revival. By reciprocal arrangements, British commercial visitors are also enabled to visit the American and French zones. In the Russian zone Soviet authorities are providing full information in response to inquiries from British interests made through the Property Control Division of the Control Commission and are permitting German agents of British firms to visit the Eastern zone. Despite vast war damage, a substantial part of the British commercial interests in Germany, estimated to have been worth some £600,000,000 pre-war, offer fair prospects of revival.

emical Industry

BUT SWITZERLAND IS HANDICAPPED— LACK OF RAW MATERIALS

THE Swiss people are severely handicapped in their efforts to build up a chemical industry by lack of coal, of raw materials, ocean access, and a large home market.* It is true they have abundant water-power, but according to some of the Swiss themselves they have not by any means made the most of this natural gift. On the other hand they have probably been fortunate in other ways or factors which they have turned to good account—the existance of a flourishing textile industry about the time the Swiss dye industry had its birth; the choice of Basle as a centre for chemical manufacture; influx of numerous French chemists who left their country as a protest against what they considered a very unjust patent system; a highly efficient banking system through which well equipped and up-to-date factories could be provided; and a good national education policy which, together with the co-operation of universities and other institutions, ensured intelligent workers and especially well-trained research and other chemical staff. One may add also the enterprise and industry of the chemical leaders and manufacturers who have known how to concentrate on certain lines of chemical industry which could best flourish in a country like Switzerland, such as dyes and intermediates, electro-chemical products, soaps, cosmetics, and pharmaceuticals, and certain branches of the heavy chemical industries.

History of the Swiss Industry

M. Fellmann traces briefly the history of these various sections of Swiss chemical industry, many of which began about 1850, though the pharmaceuticals were a little later, and indicates the principal firms, pioneers, and localities. Germany, of course, was both a keen competitor and also a good customer. To-day, and probably for some time to come, she is eliminated in both capacities. It is thought that France might to some extent take her place. In 1945, French chemical exports to Switzerland were valued at more than 7 million Swiss frs., chiefly magnesium and calcium products, methyl alcohol, collodion, pharmaceutical products and perfumes. Swiss chemical exports to France for the same year were 9.5 million Swiss frs.

Swiss dye production in 1939 represented about 15 per cent of the total world output, and practically the whole is exported, for it is now on such a scale that home demand constitutes only a very small part of the market. Pharmaceuticals also are nearly all exported, to the extent of 90 per cent, and in 1938 totalled a value of 48 million Swiss frs. But it is in synthetic perfumes that the Swiss have taken a leading position, almost rivalling France; and here again about 90 per cent of the output is exported. But most of the raw materials have to be imported, largely from France, who also is the chief customer.

Importance of Heavy Chemicals

Heavy chemicals have now become quite an important section—acids, salts, fertilisers, ammonia, caustic soda—though Switzerland is somewhat at a disadvantage competitively owing to rather high costs of production, and total output barely suffices for the home requirements. Other important branches of the Swiss chemical industry, which are already well known, are electro-chemical, cosmetic, insecticides, artificial silk and other synthetics.

In 1939 there were 1204 chemical industry enterprises, employing 22,428 people distributed among the principal branches as follows:

	Firms	*Employed*
Heavy chemicals ...	100	1754
Electro-chemical ...	37	1573
Dyes	178	7173
Pharmaceuticals ...	213	5443
Soaps, candles, waxes	380	3029

Between 1911 and 1938 the number of persons employed in textile industries declined, in watchmaking it remained stationary, but in the chemical industries it increased by 160 per cent. And, in 1939, for the first time total exports of chemical products (256 million Swiss frs.) exceeded in value those of the watch industry (196), machines (226) and textiles (246). During the first years of the war exports increased up to 1943 (279.7 million) but fell to 175.2 million in 1944. During the first eight months of 1946 they have shown an upward tendency, totalling in August for pharmaceuticals and perfumes, general chemicals, and certain dyes 40.5 million Swiss frs.

Synthetic rubber stocks in the United Kingdom are almost exhausted. At the end of November only 3970 tons were left, as against 58,860 tons at the peak period in 1944. As announced last autumn, the official policy is to import no further synthetic rubber, in view of increased Malayan output.

* From an article by Mr. J. J. Fellman in Chemie et Industrie, Dec. 1946.

A CHEMIST'S BOOKSHELF

The Chemical Kinetics of the Bacterial Cell. C. N. Hinshelwood. Pp. x + 284. Oxford University Press (Geoffrey Cumberlege). 20s.

One has no need to refer to Professor Hinshelwood's qualifications for writing on the subject of chemical kinetics. It is likewise hardly necessary to question his competence to discuss the behaviour of bacteria. Did any doubt really exist on this latter point, it would only be necessary to glance through this book with an eye to the investigations quoted, in order to realise that his practical acquaintance with research covered by the title of this book is extensive and thorough.

Professor Hinshelwood refers to this publication as an essay rather than a monograph. His proposed aim has been to produce something "which would not only give a certain general impression of the subject, but might also be helpful in guiding some further detailed work."

In his early chapters he discusses the relatively simple kinetics which have been applied to the complex problem of bacterial behaviour. For the benefit of those who are unfamiliar with the nature and behaviour of bacteria, he also gives a succinct and admirably clear outline of the nature, classification and behaviour of the various types of bacteria. This section is directed particularly to the chemist who, in most cases, will be unfamiliar even with much of the necessary terminology.

After an application of chemical kinetics to preliminary problems of the growth of cells, the adaptive powers of bacteria, both with reference to drugs and to new foodstuffs, are described and discussed. These chapters are particularly interesting, although the discussion of drug adaptation necessarily concerns itself only with certain rather limited aspects of the problem. A natural sequel to these topics, the process of selection which derives from adaptive power, follows later in the book.

The hypothesis that the production of variants, rather than, or in conjunction with, the process of adaptation, may explain certain aspects of cell behaviour, is critically examined. Other topics which receive considerable attention are the growth, division and death of bacterial cells. It perhaps should be emphasised that Professor Hinshelwood is concerned to reach the physicochemical basis, if this can be attained, of cell phenomena; discussion throughout is from this stance. Many of the problems which he raises are, in the present state of our knowledge, unanswerable. Others of them would seem to have too many answers. But the appearance of this book is timely. The bacteriological synthesis of organic compounds has become of considerable importance in recent years. This book is a lively reminder, among other things, that in order to control adequately we must understand adequately.

The reviewer was also caused to reflect, once more, that quite apart from all considerations of applications, the pursuit of pure knowledge as an end in itself is one whose fascination is supreme. It is difficult to convey—many writers have found it impossible—in cold print and in terms of scientific exposition, something of the spirit of this fascination. The present book succeeds in this to a much greater extent than the reader has the right to anticipate. He should therefore be very grateful to Professor Hinshelwood as much for this as for his valuable survey of one of the newest of our "borderline" sciences.

A word in closing must be devoted to complimenting the publishers on producing a work which helps to make us forget, while handling and reading it, the war years of austerity literature. This book approaches more nearly the best standards of pre-war publishing than anything that the reviewer recalls from this side of the Atlantic in the past five years.

Hull Forge Dismantling

The whole of the plant and equipment of the Hull Forge Iron & Steel Co., Ltd., is to be dismantled and sold. In addition to the rolling mill plant and auxiliary machine tools there is also equipment adaptable for re-erection including chimneys, buildings, overhead cranes and so on. The complete plant made available by this dismantling has been catalogued by Thos. W. Ward, Ltd., Albion Works, Sheffield, from whom copies of the catalogue are available on request.

Parliamentary Topics

THE shortages of fuel and power which have been the chief topic of Parliament this week were raised again on Tuesday in a question by Mr. Henderson Stewart—the answer to which revealed the progressively increasing closures of factories before the widespread close-down caused by the present electricity cuts. The Parliamentary Secretary, Ministry of Fuel (Mr. Gaitskell) indicated in his reply that stoppages of work due to coal shortage occurred in 595 factories consuming more than 100 tons of coal a week between January 1 and February 1. The figures were: January 1, 81 firms stopped; January 8, 71; January 25, 110; February 1, 258.

Oil Prices.—Mr. J. Strachey refused, "for reasons I have given on a number of occasions," to disclose the stock position of vegetable and sperm oils. The new increased prices of linseed, rape, castor and sperm oil, to which Sir Waldron Smithers had called attention, were based on the estimated weighted cost of the oils under our current import programme, said Mr. Strachey.

When later the question of oil prices was raised in the House of Lords at the instance of Lord Hawke, Lord Henderson, on behalf of the Government agreed that he had seen the statement reported to have been made by Senor Miranda, of the Argentine Central Bank, that he had recently made a profit of £49 million from a single operation in vegetable oils, and revealed that the Minister of Food had recently completed a contract to purchase vegetable oils and oilcake in the Argentine under which he had obtained 200,000 tons of oil, subject to allocation by the International Emergency Food Council. "The Argentine Government," added Lord Henderson, "has established a sales monopoly, buying from Argentine producers at one price and selling to buyers, whether Governments or private individuals, at a very much higher price."

Steel Development Plans.—Proposals for the development and modernisation of the steel industry in Scotland, including probably an integrated steel plant at Inchinnan, Renfrewshire, are being studied by the Steel Board but some time is likely to elapse before any decision is made—Mr. J. Wilmot.

Scottish Mineral Development.—The prospect of economic working of the minerals in the Killin area of Scotland—where chromite, magnesite, asbestic and allied beds are stated to be—is being studied by the Scottish Sub-Committee of the Mineral Development Committee, appointed by the Minister of Fuel and Power—The Secretary of State for Scotland (Mr. J. Westwood).

New Factories.—The erection of new factories and the extension of existing factories in Great Britain numbering 2066 were approved during 1946—Sir Stafford Cripps. (The corresponding figure quoted by Mr. Belcher in response to a later question was 2736 factories and extensions capable of employing 374,700.

Steel Import Duties.—Under present arrangements, supplies of steel for home use are imported almost entirely on public account and the import duty does not affect the selling price. In these circumstances the Board of Trade is not prepared to abolish import duties on Belgian steel—Mr. J. W. Belcher.

Potash Fertilisers.—Potash made available to fertiliser manufacturers and distributors in the past six months totalled 65,000 tons of potassium oxide, compared with 55,000 tons and 74,000 tons in the corresponding periods in 1945 and 1944, respectively, stated Mr. J. W. Belcher in a written answer.

Road Haulage Restriction

Drug Manufacturers' Views

CONCERN is felt by the Wholesale Drug Trade Association as to certain effects of the Transport Bill now before Parliament. The Bill prohibits the carriage, without permit of medical supplies in manufacturing and wholesale druggists' own vehicles beyond a radius of 40 miles of the place of manufacture or distribution, which, the Association foresees, would delay the passage of essential supplies, with possibly grave consequences.

Accordingly, representations were made, as a result of which a deputation from the Association was received at the Ministry of Transport last week, consisting of the chairman, Mr. Ian Fergusson; Mr. C. Mervyn Hill, Mr. F. J. Smith, and the secretary, Mr. C. W. Robinson; accompanied by the secretary of the Pharmaceutical Society of Great Britain, Mr. Hugh N. Linstead, O.B.E., M.P.; the secretary of the National Pharmaceutical Union, Mr. G. A. Mallinson and the chief pharmacist of University College Hospital, Dr. H. Davis.

The deputation outlined the special problems affecting transportation of medical and pharmaceutical supplies; and it was understood that, while the Minister would consider exemption of transportation of such supplies from restriction, this was unlikely to be granted, the Ministry feeling that in practice no difficulty would be experienced in obtaining the necessary permits.

The deputation, however, expressed apprehension that the licensing authorities would be insufficiently informed as to the special nature of the transport required and maintained that such vital supplies should be entitled to exemption.

SAFETY FIRST

Security in the Chemical Works

Safety First in Chemical Laboratories and Works. (La Sécurité dans les laboratoires et les fabriques de produits chimiques mineraux). Francis Barillet. Paris: L'Industrie Chimique et le Phosphate Réunis; 1946. Part 4, pp. 399-565.

This is a reprint of the fourth series of articles on security in chemical works and laboratories from the columns of L'Industrie Chimique et le Phosphate Réunis, Paris. The first three parts were published in that journal during 1938, 1939, and the first two months of 1940. This fourth part was begun in March 1940 and completed in February 1946. There were several long intervals when nothing could be published, for obvious reasons, e.g., only in one month of 1942, and then a break until April 1945. With typical French humour, albeit somewhat grim, the publishers number among the reasons for this discontinuity " a certain lack of cordiality in the relations between the author and the Wehrmacht and Gestapo." The title page refers to a preface by Prof. P. Pascal, of the Sorbonne, but this was presumably printed in Part I.

A Standard Work

Although the scope of the complete work is supposed to cover only " produits chimiques mineraux," it is so comprehensive and at the request of numerous readers is to include so large a number of organics (in Part 5), that the term mineral or inorganic may well be omitted. Thus enlarged it may indeed rank as one of the most complete and up to date works on this important subject, running to 700 or 800 closely-printed pages. The present part deals with ammonia and the following elements and their compounds: P, As. Sb, Bi, V, B, C, Si, Ti, Zr, Cs, Rb, Na, K, Li, Be, Al, Mg, Ba, Sr, Ca, Zn, Cd, Cu, Ag. More precisely the compounds of course only include the more important of the industrial category; and in most cases for each of the elements and these compounds the author describes (a) action on man, (b) action on animals, (c) action on vegetables, (d) fire and explosion risk; and gives a short bibliography.

At first glance, and considering that this rather formidable looking Part 4 is only one of five, the chemist might be easily excused for feeling a little appalled at the many and varied risks he runs in his daily life; and might think that life in the Services and on the battlefield is much safer—if safety is his first consideration, as it probably isn't. On the other hand, it is well that all the possible dangers should be fully exposed, analysed, and efficient precautions prescribed, as is done in this impressive work.

The inclusion of fire and explosion risks is a particularly valuable feature, especially since work with powders and dusts and explosion risks generally have increased considerably in chemical industry during the last decade or two. It is known that the insurance companies, in this country at all events, are devoting much attention through their fire and explosion research organisation, to extension of this class of risk, and are insisting more strictly on safety measures in buildings and equipment. With our present shortage of trained and capable men we cannot afford to lose or incapacitate any through carelessness or ignorance or both.

M. Barillet has expended a vast amount of labour and research in the compilation of this valuable work which contains not only detailed information on the specific subject with which it deals, but also presents a fairly thorough review of the whole field of industrial chemistry wherein any risk of any sort is likely to be encountered.

As already stated numerous organic compounds are to be treated in Part 5. The carbon compounds here included are: the two oxides, metallic carbonyls, carbonates, acetylene, ethylene, and methane. In paging the table of contents a small error has been made, in that the page number given in each case is 2 less than it should be. For example, chap. 18, carbon and compounds commences on page 461 instead of 459 as given in contents; Glucinium (Beryllium) the subject of chap. 27 begins on page 516 and not 514, and so on.

German Steel Standards

STANDARDS for steel and aluminium alloys are included in a 636-page microfilmed collection of German metallurgical research papers published by the Office of Technical Services, Department of Commerce, Washington. Among the subjects covered are: the creeping behaviour of aluminium alloys and heat resistant iron materials at high temperatures; standards and applications of various steels; endurance of non-welded chromium-molybdenum steel tubes under stress; experiments on the metal-arc welding of thin sheets of chromium-molybdenum steel; studies of butt-welded joints; the fatigue failure of metallic materials; and numerous lectures and discussions on various topics, one of which was a " ferrograph " designed to detect foreign materials in steel.

Manufacturers and merchants need no longer obtain a licence from the Minister of Works to manufacture or sell asbestos cement products. The Minister has directed that the Control of Roofing and Other Materials Order 1942, shall no longer apply to asbestos cement products.

Industrial Outlook in the U.S.A.

From Our New York Correspondent

THE United States industrial products market—according to a U.S. Commerce Department survey of industrial trends and trade prospects—should be better balanced in 1947 than it was last year, provided the present level of operations can be maintained. Overseas customers for United States goods should therefore find it easier to realise their requirements.

Obviously prospects vary from industry to industry. Of important metals, only magnesium, with production probably rising from 20,000,000 lb. last year to 30,000,000 lb. in 1947, will exceed demand, estimated at 20,000,000 lb. Non-ferrous metals should enter a more stabilised period, following the price disturbances late in 1946, with supplies lagging behind demand by about 10 per cent in copper; 20 per cent in tin; and 25 per cent in lead. Aluminium will continue in short supply.

Supply of Chemicals

In chemicals, both production and consumption of supplies for industry are estimated to exceed that of the last two years. Production of paints, insecticides (with DDT products rather short), and particularly medicinals, including penicillin and streptomycin, should increase substantially. Plastics, despite higher output, will still be in short supply.

Natural and synthetic rubber should be ample for industrial needs. The United States Government, still holding war-built synthetic rubber plants, expects to produce 508,000 tons. Added to the natural production available, the synthetic product should balance the rubber market.

More persons in the United States were working in the manufacturing and other non-agricultural activities in December last than at any time in the nation's history, according to the U.S. Employment Service; in 1947, however, it is predicted that fluctuation rather than expansion will be the feature of the labour market. The total number of employed persons in December was 56,300,000 —a record year-end figure—while 2,120,000 were unemployed.

The number of business firms in the United States has grown since VJ-Day to a record total estimated by the Department of Commerce at 3,650,000, compared with some 3,100,000 when the States entered the war; but the rate of increase is likely to moderate in the coming year.

In expansion, however, businessmen in the States apparently plan to break more records, for extensions of plant and equipment at an annual rate of 15,000,000 dollars are projected for the current quarter—greater than in the post-1929 peak year of 1941. Non-agricultural businesses are estimated to be spending some 3,600,000,000 dollars in this direction during the quarter—65 per cent more than in the same period last year and 300 per cent more than in that of 1945.

The Federal Reserve Board reports that small business fared better financially during the war than the big companies. By the end of 1945 small- and medium-sized concerns were, states the report, " probably in a more liquid position than they had ever been in the history of the country, showing a relatively greater increase in sales, profits and assets " than larger companies.

Trioxane

Plasticiser, Fuel and Solvent

New York: Trioxane, a polymer of formaldehyde useful as a fuel, solvent, plasticiser, intermediate in organic reaction processes, and for a wide variety of other industrial purposes, is now available for commercial distribution according to an announcement made by the E.I. Du Pont de Nemours & Co.

Trioxane, a colorless, plastic, crystalline solid, has a sweet odour, not unlike that of chloroform, and has no trace of a formaldehyde odour. The product ignites instantly and burns with a very hot, non-luminous, clean, odourless flame, a property suggesting its possible use as a packaged fuel for campers, picnickers, hunters, and industrially, wherever a packaged fuel is required.

Readily soluble in alcohols, ketones, ethers, esters, chlorinated hydrocarbon solvents and aromatic hydrocarbons, trioxane, in molten state, is itself a solvent for many organic substances, including phenol, naphthalene, vegetable oils, fatty acid amides, urea, and, in the presence of water, the protein, zein. Where its volatility is not objectionable, these properties suggest the possible use of trioxane as a plasticiser of other materials. Trioxane-zein compositions, for example, are believed to present many potential applications in coatings and as plastic aggregates.

The solubility of trioxane in most types of organic materials makes its use possible as an intermediate in organic reaction media. In such anhydrous media, the product is stable if the system is neutral or alkaline. Small amounts of strong acids or acid-forming substances cause the compound to depolymerise to monomeric formaldehyde at a rate that may be controlled by regulating the catalyst and temperature.

French Chemical Finance

Large Profits

RECENT reports of French companies for 1945 or 1945-6 show, in some cases at all events, relatively large profits which may or may not be merely nominal, and also some large capital increases. For example Algerienne de Prod. Chim. made a profit in 1945 of 7.2 million frs., and are increasing their capital to 300 million; Usines Dior for 1945-6, profit 1.7 million frs., with capital increase; Electro-Chimie et Acières d'Ugine for 1945, 20.5 million frs.; Hydrocarbures de St. Denis are doubling their capital, to 76 million frs.; and Phosphates de Constantine are increasing theirs to 202.5 million frs. On the other hand Comptoir de l'Ind du Sel made a loss of 7.3 million frs. In regard to Norvegienne de l'Azote it appears that, at the date of the report, no agreement had been reached between France and Norway as to allocation of shares and other matters. The Pechelbronn firm in 1945 made a profit of 12.3 million frs., with reserves at 187 million frs. This concern in association with others is sponsoring formation of a new company, Soc. de Recherches Minières et Petrolières, with a capital of 12 million frs. Phosphates et Chemins de Fer de Gafsa made a large profit of 134.7 million frs.; Phosphates Tunisiens 11.3, and Produits Azotés 5.2, this last being cancelled apparently by a previous loss.

Prevailing Difficulties

The French finance journals, writing in regard to the well-known Estab. Kuhlmann and others, emphasise the serious lack of fuel, transport, and in many cases raw materials, higher wages, and low controlled prices. Kuhlmanns are short, *inter alia*, of Spanish pyrites, but their order books are full to over-flowing. La Soc. des Matières Colorants are a little more cheerful, and despite difficulties, output has substantially increased. Soc. des Usines Chim. Rhône-Poulenc speak of various shortages, including metals and fuel, which prevent them regaining their former position in the world's markets, while they complain the profit margin is low. Cie. Alais-Froges et Camargue say the same, but they are endeavouring to develop new lines, such as light metals and artificial rubber. Soc. des Engrais de Roubaix report some improvement in the second half of 1945, phosphate was arriving more plentifully from N. Africa, potash mines have increased output, though nitrogen fertilisers have had to be supplemented by imports. In 1946 conditions as to coal, electricity, raw material, and transport had much improved. *La Vie Française*, in its comments, deplores the blind control (dirigisme aveugle) under which many chemical firms are working with greatly increased costs, including wages, but with controlled prices at a level which allows little profit margin.

Chemistry of Rubber

Colombo Project

A STATE laboratory to serve the rubber industry in Ceylon by working out new lines of manufacture is to be established in Colombo at a cost of approximately Rs. 200,000. The proposal is now before the Executive Committee of Labour, Industry and Commerce, and if the committee approves, which it is very likely to do, supplementary provision for the establishment of the laboratory would be sought at an early date.

Dr. A. Sunderalingam, Government Rubber Technologist, said that since his appointment in June this year, he had been working as the guest of the Rubber Research Scheme in its laboratory, and it was now proposed to provide the necessary equipment and building in Colombo to serve the industry as a whole—both private and Government requirements.

The laboratory would undertake research on the chemistry of rubber with special reference to factors in tropical countries, and would investigate the possibilities of production of partly processed rubber for export to rubber consuming countries.

Dr. Sunderalingam said that the quality of rubber goods produced in the island would be tested and suggestions made for the improvement of such articles. Besides, the laboratory staff would give personal advice and assistance to all manufacturers of rubber goods to help them to improve the quality and the rate of production of rubber articles in Ceylon.

Production of Drugs

Ceylon will put into effect shortly a major scheme for the production of drugs, alkaloids, and vitamin products. The production of shark liver oil is one of subsidiary activities of this scheme, although at present it is only a minor activity attached to the laboratory of the Government quinine factory and operates on an annual vote from revenue.

Locally manufactured shark liver oil, said Mr. E. C. S. Paul, Deputy Director of Commerce and Industries, contains four times the vitamin A and D potency of cod liver oil. Present factors against the commercial production of shark liver oil, at a uniform level of 8000 units, he said, were lack of efficient transport and stabilisation of methods of preparation. The Department of Commerce and Industries had now to move its extraction centre from time to time, to various points along the coast where shark was in season.

Forthcoming Events

TUESDAY, FEBRUARY 18

Institution of the Rubber Industry (London Section). The Waldorf Hotel, Aldwych, W.C.2., 6.30 p.m. Dr. R. G. James, B.Sc., A.R.I.C., F.I.R.I.: "Latex Thread and its Industrial Applications." Mr. L. Appleton: "Resilient Products Composed of Latex Bonded Fibres."

Hull Chemical and Engineering Society. Church Institute, Albion Street, Hull, 7.30 p.m. Mr. E. Hoes, M.I.Mar.E., A.M.I.Mech.E., "Compressed Asbestos Jointing."

WEDNESDAY, FEBRUARY 19

Royal Institute of Chemistry. Royal Institution, Albemarle Street, W.1., 6.30 p.m. G. H. Lees, M.C., D.F.C., Ph.D., "British Oilfields and Oil Exploration."

The Chemical Society and Royal Society of Arts. John Adam Street, Adelphi, W.C.2, 5 p.m. Sir Harold Hartley: "A Century of Chemistry."

Royal Society of Arts. John Adam Street, Adelphi, W.C.2., 5 p.m. Sir H. Spencer Jones, M.A., Sc.D., F.R.S.: "Modern Astronomical Instruments." (Truman Wood lecture).

THURSDAY, FEBRUARY 20

Chemical Society, Society of Chemical Industry, and Royal Institute of Chemistry (Edinburgh and East of Scotland Sections). North British Station Hotel, Edinburgh, 7.30 p.m. Neil Campbell, D.Sc.: "Fluorescence."

Chemical Society. Burlington House, W.1. 7.30 p.m. W. E. Garner: "The Reduction of Oxides by Hydrogen and Carbon Monoxide." R. F. Tuckett: "The Photochemical Polymerisation of Vinyl Acetate Vapour" and "Radical Sensitised Polymerisation of Vinyl Acetate Vapour."

Textile Institute (Yorkshire Section). Midland Hotel, Bradford, 7.30 p.m. Professor J. B. Speakman, D.Sc., F.R.I.C., "Proteins and Plastics."

Chemical Society, Chemistry Lecture Theatre, Liverpool University, 5 p.m. Professor E. L. Hirst, M.A., D.Sc., F.R.S.: "Recent Developments in the Chemistry of Starch and Glycogen."

FRIDAY, FEBRUARY 21

Textile Institute (Irish Section). Mansion House, Dawson Street, Dublin, 7.30 p.m. Dr. F. C. Wood, Ph.D., M.Sc., F.R.I.C.: "Some Recent Developments in Cellulose and Wool Science and Technology."

Society of Instrument Technology (Scottish Section). Royal Technical College, Glasgow, 7 p.m. M. H. Arnold: "Electrical Measuring Instruments."

Chemical Society. Physics Lecture Theatre, University College, Southampton, 5 p.m. Sir Ian Heilbron, D.S.O., D.Sc., F.R.S.: "The Chemistry of Vitamin A."

SATURDAY, FEBRUARY 22

Institution of Chemical Engineers (North Western Branch). The College of Technology, Manchester, 3 p.m. Mr. V. G. Jenner, B.Sc.: "Fuel Economy in a Small Factory."

MONDAY, FEBRUARY 24

Institution of the Rubber Industry (Manchester Section). Engineers' Club, 6.15 p.m. H. C. Harrison: "The Extension of Rubber."

TUESDAY, FEBRUARY 25

Chemical Society. Chemistry Lecture Theatre, Leeds University, 6.30 p.m. Professor Wilson Baker, M.A., D.Sc., F.R.S.: "The Chemistry of Penicillin."

WEDNESDAY, FEBRUARY 26

Institute of Welding. Institution of Civil Engineers, Great George Street, S.W.1., 6 p.m. H. E. Lardge: "Welding in the Development of Jet Propulsion Engines."

THURSDAY, FEBRUARY 27

Chemical Society. Joint meeting with the University Chemical Society. Chemistry Lecture Theatre, Sheffield University, 5.30 p.m. Professor D. H. Hey, D.Sc., Ph.D., F.R.I.C.: "Homolytic Reactions."

FRIDAY, FEBRUARY 28

British Gas Council. 1, Grosvenor Place, S.W.1. Exhibition showing the use of Infra Red Heating by Gas.

MONDAY, MARCH 3

Society of Chemical Industry (London Section). Joint meeting with London Section of the Institution of the Rubber Industry. Institution of Civil Engineers, Great George Street, S.W.1. S. A. Brazier, M.Sc., F.R.I.C., F.I.R.I., M. M. Heywood, A.R.I.C., F.I.R.I., Geo. Martin, B.Sc., F.I.R.I., Dr. W. J. S. Naunton, M.A., M.Sc., F.R.I.C., Dr. J. R. Scott, F.R.I.C., F.Inst.P., F.I.R.I.: "Rubber, Natural and Synthetic."

Oil and Colour Chemists Association (Hull Section). Royal Station Hotel, Hull 6.30 p.m. H. A. Holden, M.Sc., A.R.C.S., D.I.C.: "The Phosphate Treatment of Metals Prior to Painting."

TUESDAY, MARCH 4

Industry of Chemical Engineers. Geological Society, Burlington House, W.1., 5.30 p.m. L. Silver: "Gas Cooling with Aqueous Condensation."

FRIDAY, MARCH 7

The Institute of Welding. Lewisham Technical Institute, 7 p.m. Mr. J. D. Beddows: "The Welding of Aluminium."

Personal

COMMANDER E. WHITEHEAD has succeeded Mr. Hubert Watson, B.Sc. (Econ.), as general secretary of the British Association of Commercial and Industrial Education.

MR. R. W. P. HOLT, M.I.Mech.E., has been appointed to the board of the Widnes Foundry & Engineering Co., Ltd., a company he first joined in 1925.

The late MR. JOHN CALVERT OXLEY, managing director of J. C. Oxley's Dyes and Chemicals, Ltd., Lighthouse Works, Heckmondwike, left £26,400, net personalty £25,004.

The late MR. FREDERICK W. AKEROYD, J.P., of Southport, senior director of Wilkinson and Akeroyd, oil distillers and soap manufacturers, and a former Mayor of Batley, left £21,456, net personalty £11,912.

MR. W. STEUART TRIMBLE and MR. R. S. JUKES have been appointed joint managing directors of British Plaster Board, Ltd. MR. C. MACFARLANE CULLEN and MR. ROBERT G. FORSYTH, secretary, have also become directors.

DR. ALEXANDER FLECK, D.Sc., who has been responsible for the agricultural activities of I.C.I. since 1944, has been appointed chairman of Scottish Agricultural Industries, following the retiral of Mr. H. D. Butchart.

DR. W. H. GARRETT'S appointment as director of production, MR. F. S. MORTIMER'S as industrial and public relations manager, and BRIGADIER N. F. PATTERSON'S as works manager (at the Ruabon works) are changes announced by Monsanto Chemicals, Ltd.

MR. DAVID E. ROE, honorary secretary of the Oil and Colour Chemists' Association, London Section, is joining the board of Paramount Paints, Ltd., as from March 1, and his address for all matters, including the Association's business, will be Paramount Paints, Ltd., Burlington Road, Fulham, London, S.W.6.

MR. J. R. ROWLANDS, M.Sc., A.R.I.C., who has taken over the headship of the Science Department of Nottingham and District Technical College, had previously held positions with Nobel's Explosives Co., Ltd., Chance & Hunt, Ltd., and the Boots group; and latterly was head of the Chemistry Department of Halifax Municipal Technical College.

DR. L. H. LAMPITT, president of the Society of Chemical Industry; MR. H. J. T. ELLINGHAM, secretary of the Royal Institute of Chemistry; and PROFESSOR WILLIAM WARDLAW, senior honorary secretary of the Chemical Society, were among those accepting invitations to the conference convened by the Royal Society of Arts in connection with the proposed International Exhibition [*see* page 249].

Obituary

MR. FRED SHOESMITH, who founded and was managing director of Fairy Dyes, Ltd., has died in Glasgow, aged 73. Prominent in public life, he was formerly a member of Glasgow Corporation.

Reinstatement Appeal

At a sitting of the Glasgow Reinstatement Committee last week, Colin Samson, an ex-soldier, appealed against dismissal less than six months after his reinstatement as a labourer by Messrs. J. & J. White, Ltd., chemical manufacturers, Rutherglen.

Mr. Hay, works manager of the firm, stated that the trade unions objected to retention of returned ex-Service men where the total service of these men, including time in the Armed Forces, was less than that of others whom they had to make redundant. He said it was the union organiser who had advised Messrs. White to dispense with the services of Samson and retain other labourers with less service. All the men were union members.

The committee unanimously decided to make a reinstatement order from February 10 and granted Samson compensation amounting to £12 18s., being three weeks' pay from January 17.

Leave to appeal to the umpire against the decision was granted.

A further case before the committee was that of Robert Anderson, who had been employed as a labourer by Messrs. White. He was also ordered to be reinstated and was granted a compensation order for £12 18s.

Steel Plan and Scotland

No provision has been made for a continuous sheet mill in Scotland under the British steel industry's seven-and-a-half-year plan for reorganisation costing £168,000,000, declared Mr. Charles D. Rigg, a prominent member of the Scottish steel trade, in an address to the Glasgow Publicity Club recently.

Few people seemed to realise that 90 per cent of the light industries depend upon sheet steel as one of their chief raw materials. To encourage the establishment of light industries in Scotland we must have an adequate supply of steel sheets made by the most up-to-date methods. In his view, Great Britain should be planning for a minimum of six or seven continuous sheet mills, and at least one of them should be in Scotland. The United States had 40, and was planning more. Even impoverished France under the Monnet Plan would have two continuous mills.

Home News Items

Richard Klinger, Ltd., has opened a new branch office and depot at 11, Goree Piazzas, Liverpool 3, telephone Central 3497.

The first party of Italian foundrymen was due to arrive in Britain this week, under an agreement between the Governments of the two countries, covering 2800 workers, of whom 800 are skilled.

Unless 630 tons of steel needed for plant replacement at Manchester's Bradford Road gasworks, are delivered without delay the city will be worse off for gas next winter than now. Despite representations to the Government by the Town Clerk and an M.P., only 6 tons have been delivered to the contractors.

The suggestion that Birmingham Corporation should provide a centre as a meeting place for chemists and other scientific groups was made by Mr. C. B. Ball, chairman of the Midland Chemists' Committee, at the recent annual dinner and dance of the organisation. The idea was warmly supported by Ald. Bradbeer, a guest.

The Association of Supervisory Staffs, Executives and Technicians enrolled over 4000 new members in the past year and now has more than 200 branches. Affiliated to the National Federation of Professional Workers and the Trades Union Congress, the Association limits membership to those in managerial positions. Eight members in the House of Commons have formed a Parliamentary group under Mr. Ian Mikardo, M.P. for Reading.

In a memorandum to the Chancellor of the Exchequer, the National Union of Manufacturers urges that it is essential in the interests of British industry that the Government " put some ceiling upon the constant demands for wages increases and shortening of hours." It is further urged that Excess Profits Tax and National Defence Contribution should not be replaced by any new selective tax, such as another profits tax or turnover tax. " Pruning " of national expenditure, elimination of the purchase tax, and reduction in the standard rate of income tax are also advocated.

Fire in the laboratory of British Glues and Chemicals, Ltd., Newark, resulted in the death of a young employee, Richard Henry Riddell, of Wolverton, and severe injuries to a girl assistant.

The Board of Trade Regional Office (Wales) is removing as and from Monday, February 17, 1947, to Imperial Buildings, Mount Stuart Square, Docks, Cardiff. Telephone: Cardiff 5920.

Declining output of Scottish steel is the subject of discussion by a group of Scottish Socialist M.P.s with Mr. John Wilmot, Minister of Supply. Operations of steel users all over Scotland are being severely limited by shortage of supplies which has ruled since 1920. Government facilities to permit a widespread of modernisation to step up production are to be sought.

A reconstruction programme, in the next three to five years and costing £4,000,000, is to be carried out at the Hawarden Bridge Steelworks, of Messrs. John Summers and Sons, Ltd. The project will raise the annual output from between 350,000 and 400,000 tons to 500,000 tons of sheet steel. The company is to raise £2,200,000 to help finance the scheme.

Demand for its crude and refined products, in the United States and other overseas markets, continues to expand and to absorb its entire production, reports Borax Consolidated, Ltd. [See also " Company News," page 273]. In the home market there have been indications of increased activity, particularly in enamelling and kindred industries. Products of the United States Potash Company continue to enjoy a ready market.

The Industrial Finance Corporation, founded by the Bank of England and 19 joint stock banks, has in little more than a year since it was set up disbursed more than £7 million providing capital aid for industry. Announcing this, the chairman, Lord Piercey, explained that the reason the Corporation had not distributed a larger part of its £45 million available capital was that at present new funds in industry tended to be used more slowly than was anticipated.

Minimum charges for telephone calls to South-West Africa, Southern Rhodesia, and Northern Rhodesia have been reduced from £3 5s., £3 9s. and £3 15s. respectively to £3.

The office of Orr's Zinc White, Ltd., has been transferred from 95 Gresham Street, London, E.C.2, to the new offices of Imperial Smelting Corporation, Ltd., at 37 Dover Street, W.1 (telephone: Regent 8161).

Overseas News Items

Aluminium dust therapy for the prevention of silicosis is to be introduced in West Australian mines, by order of the Ministry of Mines.

Nationalisation of the French iron and steel industry was favoured by a vote of 12-9 by the Industrial Production Commission of the French National Assembly.

A factory for production of plastics is being erected in Holland by Bataafsche Petroleum M.Y., the operating company of the Royal Dutch Shell undertaking.

Five hundred tons of development ore from the Porphyry mine, taken from 200-ft. level, is to be treated at a local Government mill, it is reported from Perth, Australia.

Total damage to installations and oil stocks of the Trinidad undertakings during the recent disturbances is estimated at £6000, according to the London offices.

Cargoes for Buenaventura, Colombia, are being diverted to Cartagena because the former port, owing to congestion, has been closed and is not likely to be available before about February 26.

Whale-oil and its by-products will, until further notice, be regarded as non-regular exports, announces the Central Bank of Argentina, and a certain price difference will be used for renewing equipment and otherwise developing the whale-oil industry.

"Hempro" is the title of the recently formed chemical import and export trading division of the federal trading organisation established by the Jugoslavia Government. Mineral ores and mining machinery will be dealt with by the new "Jugometal" organisation.

Oxygen gas at 15s. to 25s. a ton, is reported to have been produced at the Massachusetts Institute of Technology in small low-cost generating plants. The use of this cheap oxygen gas might make possible the development of low-grade fuels, at present uneconomical to use.

Malayan palm oil production in 1946 totalled 11,756 long tons (1940, 57,972), of which Perak produced the largest individual contribution—4663 long tons. Total production of palm kernels in the same period was 931 long tons (1940, 9611), of which the chief sources were Perak and Selangor.

East Africa has been so incompletely prospected that there may be good mines still undiscovered. This is the opinion of Mr. Donald D. Smythe, after a tour of mining areas of Tanganyika and other parts of East Africa on behalf of the Frobisher Exploration Co., subsidiary of the Canadian mining house, Ventures.

International Management Congress

The Eighth International Management Congress, the first since the war, which is to be held in Stockholm on July 3 to 8, derives an added importance from the present emphasis on heightened efficiency in industrial management, as well as from the substantial changes in managerial functions which have occurred since the last international congress of managers was held in Washington in 1938. The programme now being issued by the organisers, the International Committee of Scientific Management and the British Management Council, which is making the arrangements for British participation, indicates that the congress will study the human and social aspects of management rather than the material problems. All arrangements in this country are being made by the Secretary, British Management Council, 15 George Street, London, E.C.4.

Industrial Alcohol Bill in Eire

During the committee stage of the Industrial Alcohol Bill in the Eireann Senate, Professor W. R. Fearon protested that the Bill gave power to the alcohol company to manufacture and sell any substance which could be obtained by chemical process.

An amendment, to provide for the import, free of duty, of any chemical product which is used as an agricultural raw material, in all cases where the corresponding product of domestic manufacture was available, only at a higher price, was withdrawn.

Sir John Keane proposed a further amendment to provide that the Act should not come into force until a report had been obtained from expert authority on the prospects of establishing a chemical industry in Eire, and such report had been considered by both Houses of the Irish Parliament. He said that if he were starting a chemical industry in Eire, he would give a licence to Imperial Chemicals to come in and do the job, as they could do it much better than people in Eire whose experience was limited. This amendment was also withdrawn and the committee and final stages have now been passed.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for errors that may occur.

Mortgages and Charges

(Note.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

PARKIN NESS and CO., LTD., Darlington, chemical manufacturers. (M.14/2/47.) January 13, mortgage to Midland Bank Ltd. securing all moneys due or to become due to the Bank; charged on Parkgate Chemical Works and 45 and 47 Parkgate, Darlington, together with fixtures and fittings. *£850. December 31, 1941.

MARCHON PRODUCTS LTD., London, N.W., chemical merchants. (M.14/2/47.) January 13, four charges, to Barclays Bank Ltd., each securing all moneys due or to become due to the Bank; respectively charged on land and buildings at Ladysmith, cottages and warehouse at Swingpump Lane and Ribton Lane and Corkickle House, 7 Corkickle, all Whitehaven and Evelyn House, West View, Hensingham. *£1013. December 31, 1945.

Company News

With a revenue for 1946 of £90,688 (£70,113), **English China Clays, Ltd.**, showed a net profit of £48,124 (£33,797).

International Nickel Company of Canada has declared the usual quarterly dividend on Common of 40 cents (U.S. currency) per share. Total dividend for 1946 was 1.60 dollars (same).

Gross trading profits of **London Aluminium**, which was made a public company in June 1946, are reported at £147,360, net trading balance being £27,248. A final dividend is declared of 10 per cent, making 20 per cent.

Accounts of **Universal Asbestos Manufacturing Co., Ltd.**, for the year ended September 29, 1946, show a profit of £117,874 (£103,253). A dividend for the year of 1s. 6d. (1s.) per 5s. share is recommended.

A net profit of £28,522 (£23,911) is reported by **Redfern's Rubber Works, Ltd.** Final dividends are recommended of 3¾ per cent on "A" and "B" Preferred, making 7½ per cent, 5 per cent (6¼) on Ordinary, plus bonus of 5 per cent (2), making 15 per cent (12).

Borax Consolidated, Ltd., announces a net profit for the year ended September 30, 1946, of £412,584, compared with £357,238 for the previous year. A dividend of 7½ per cent (same) and bonus of 2½ per cent (nil) on Deferred Ordinary stock are recommended.

Crude oil production of the Kern oil group during the year ended May 31, 1946, was 1,534,927 barrels—an increase of 191,279 barrels. Net profit of the parent company, **Kern Oil Co., Ltd.**, was £18,952 higher at £61,666; and dividend was increased from 6 to 8 per cent.

At an extraordinary meeting of **Thomas De La Rue and Co., Ltd.**, concerned with arrangements for raising new capital, plans for extended activities, particularly in plastics, were announced. The chairman, Mr. B. C. Westall, C.B.E., explained a proposal to sell the moulding section—De La Rue Plastics, Ltd. The new company, National Plastics, Ltd., and Moulded Products, Ltd., concentrating on production of moulded articles on a large scale, should, he said, have a prosperous future. The company was not giving up plastics, he emphasised; the capital requirements of De La Rue Insulation, Ltd., for the new plastics expansion would exceed the proceeds of the sale of the plastics company by more than £300,000.

PHOSPHOR BRONZE TESTS

Tests of phosphor bronze are to be carried out for the Union Government of South Africa with a view to the preparation of a list of suppliers whose products are of the approved specifications. Applications for inclusion in the list are invited by the Chief Stores Superintendent, S.A.R., P.O. Box 8617, Johannesburg, and samples of B.S.S. 369 or B.S.S. 2B8 should at the same time be sent to the Stores Superintendent, S.A.R., Pretoria. Such samples must consist of two bars 1¼ in. or 1½ in. by 2 ft., stamped with the supplier's name, and accompanied by a cheque for £2 2s. for the test fee and the brand name.

Chemical and Allied Stocks and Shares

DOMINATED by the fuel crisis and the resulting dislocation of industry, stock markets recorded a heavy fall in values earlier in the week, when there was a general marking down and widening of quotations. This was largely a precautionary measure on the part of jobbers and was an important factor in preventing any very heavy selling. In the absence of the latter, industrial shares tended to firm up later but, as was to be

expected, recorded sharp declines on balance. British Funds participated in the downward movement, led by 2½ per cent. Consols; but, on the other hand, there was a slightly better tendency in nationalisation stocks, electric supply and home rails improving, the latter on further consideration of the L.M.S. dividend statement. Colliery shares recorded only moderate declines, but iron and steels showed a fairly sharp reaction.

Earlier in the week Imperial Chemical, reflecting the general trend, came back from from 44s. 1½d. to 42s. Turner & Newall declined from 88s. 6d. to 86s. 3d.. United Molasses from 56s. to 54s. 6d., and Lever & Unilever from 52s. 6d. to 51s. 3d. The market was depressed by the difficulty of assessing the extent to which individual companies would be affected by the " cuts " in production resulting from the fuel crisis; and at the outset prices were marked down indescriminately. Subsequently, some of the heavy declines attracted buying interests on yield considerations. Imperial Chemical at 42s., for instance, yield over 3¾ per cent on the basis of the 8 per cent. dividend which has ruled over a long period of years. There is now less hopefulness of an increased dividend for the past year, but even so it is generally felt there is every reason to assume that the 8 per cent. rate will at least be maintained. Associated Cement receded to 63s. 9d., Dunlops declined from 72s. 9d. to 71s. 1½d., English Electric from 62s. 9d. to 61s. 3d., and General Electric from 98s. 3d. to 95s.

Among iron and steels, Guest Keen receded from 46s. 1½d. to 45s., Dorman Long from 26s. 6d. to 25s. 9d., Stewarts and Lloyds from 57s. 9d to 55s. 6d., and United Steel from 25s. 4½d. to 24s. 9d. Powell Duffryn went back from 26s. 1½d. to 25s. 9d., and Staveley from 57s. to 56s. 6d., the reaction in colliery shares being relatively small. Borax Consolidated deferred, despite the excellent impression created by the financial results, were lower at 50s. 3d. British Aluminium at 45s. 3d. showed little movement on balance, but British Oxygen declined from 96s. 3d. to 93s. 9d., and British Plaster Board fell back from 32s. 7½d. to 31s. 6d. The units of the Distillers Co. reflected the general trend, being 133s. 9d., against 135s. 6d. and among plastics De La Rue were ¼ down at 14¾.

There was a fair amount of activity around 50s. in Blythe Colour Works 4s. ordinary shares, which were favoured on current dividend estimates. Business at 12s. 9d. was recorded in Greeff-Chemicals Holdings 5s. ordinary, Morgan Crucible were 58s. 9d., and Stevenson & Howell 5s. ordinary 31s. A weak feature was provided by Metal Box shares, which were marked down 10s. to 103s. 1½d. on the effects of the fuel crisis; but, as in many other directions, though few buyers were in evidence, the fall in prices led to no heavy selling. In other directions, Boots Drug were lowered from 64s. 4½d. to 63s. 1½d. earlier in the week and Beechams deferred from 27s. 7½d. to 27s. Paint shares were also lower, Lewis Berger losing ¼ at £8, while International Paint declined ½ to £7¼. There was little business in oil shares, price movements being small, though, against holders, Shell moved back to 97s. 6d and Burmah to 71s. 3d.

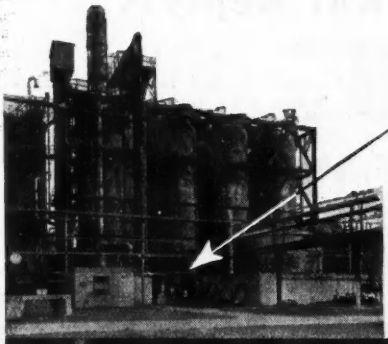
British Chemical Prices

Market Reports

THE market generally is overshadowed by the fuel emergency and its effect on the already tight supply position. Contract deliveries are being maintained wherever possible, but the dislocation in raw material supplies, as a result of reduced production in the non-priority sections of the industry, must inevitably prolong the difficulties of the consuming industries for a considerable time. Prices are very firm and the tendency is towards higher levels. An advance in the controlled rates for bichromates is reported, although details are not yet available. Apart from the influence of present conditions, there is little of interest to report on the coal tar products market.

MANCHESTER.—It is as yet difficult to estimate the full effect of the electricity cut on both production and consumption of chemical products in the Lancashire area, but there is no doubt that it has been very serious and the most that is hoped for is that the restrictions will continue only for a few days. There has, however, been fresh inquiry on the Manchester market during the past week for textile and other chemicals for home consumption, as well as from shippers, but, in consequence of the current supply position of some of the alkalis and other products, firm business on export account is not easy to arrange. Certain sections of the tar products trade have also been affected from a production point of view.

GLASGOW.—In spite of serious restrictions on trading experienced in Scotland, in common with the rest of the country, due to fuel shortage and bad weather conditions, fairly active conditions have prevailed during the week. Orders placed have been well up to standard, although in many cases deliveries are very slow. Prices show every sign of remaining firm, or even increasing. In the export market, business has been received for such chemicals as magnesium carbonate, talc, precipitated chalk, soda crystals, caustic soda, dextrine, tar products, Glauber and Epsom salts, but here deliveries are subject to ability of manufacturers to supply and the shortage of shipping space.



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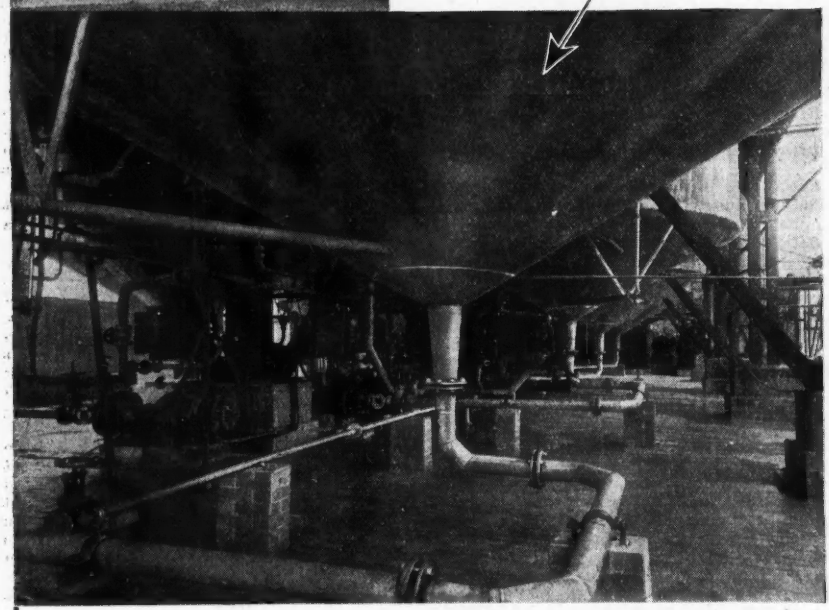

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German Technical Reports

Latest Publications

LATEST technical reports from the Intelligence Committee in Germany include the following, copies of which are obtainable from H.M. Stationery Office at the prices stated.

BIOS 229. Wrought light alloy plants in Southern Germany (6s.).

BIOS 696. Manufacture of phosphate esters at Bitterfeld (2s.).

BIOS 731. Manufacture of carbon tetrachloride at *I.G. Farben, Bitterfeld* (4s.).

BIOS 860. Iron powder. Notes on German production methods at *Duesseldorfer Eisenhuettengesellschaft,* and *Deutsche Eisenwerke* (2s.).

BIOS 873. By-product ammonia recovery (1s. 6d.).

BIOS 875. *I.G. Farbenindustrie A.G., Uerdingen*: Phthalic anhydride plant (1s.).

BIOS 876. *I.G., Oppau*: Coke-oven gas separation by Linde (6d.).

BIOS 882. Aluminium foil production (3s.).

BIOS 896. Manufacture of zirconium-potassium fluoride, zirconium oxide and zirconium oxychloride (6d.).

BIOS 908. Manufacture of products from powdered metals (2s.).

BIOS 926. Interrogation of Dr. Eisenmann, of *Dynamit A.G., Troisdorf,* at Beltane Schools, S.W.19: Moulding powders and laminated sheet (1s.).

BIOS 930. *Duisberg Kupfer Huette, Duisberg*: Preparation of zinc by electrolysis)1s. 6d.).

BIOS 935. *I.G. Farbenindustrie, Ludwigshafen am Rhein*: Manufacture of phthalic anhydride (1s.).

BIOS 937. Dr. F. Raschig, G.m.b.H., Ludwigshafen am Rhein, tar products (1s.).

BIOS 939. *I.G. Farbenindustrie, Leverkusen*: Manufacture of synthetic phenol, resorcinol, pure anthracene and pure carbazole (2s. 6d.).

BIOS 953. *I.G. Farbenindustrie, Leverkusen*: Interrogation of Dr. Roelig: Corrosion-preventing coatings of Buna S-ebonite (1s. 6d.).

BIOS 957. Developments in rheolaveur through washing in Belgium: Coal washing (3s. 6d.).

BIOS 962. Production of tungsten wire and processing of scheelite (4s. 6d.).

BIOS 968. *I.G. Farbenindustrie A.G.*: Plastomers: Notes on testing. Interview with Dr. Stocklin and Dr. Roelig, formerly of the Leverkusen Laboratories (6d.).

BIOS 996. *Stadtgaswerke, Hameln*: Detoxification of town's gas (6d.).

BIOS 988. German dyestuffs and dyestuffs intermediates. Azoic products including naphthols, fast salts, nitrosamines and rapid fast salts, rapidogens (4s.).

BIOS 1000. *Preussag Kaliwerke, Stassfurt*: Potash recovery and bromine manufacture (1s. 6d.).

FIAT 524. Production of aluminium (4s. 6d.).

FIAT 432. Manufacture of refractories and information concerning their use in the iron and steel industry of Western Germany (12s. 6d.).

FIAT 720. German techniques for handling acetylene in chemical operations (11s.).

FIAT 724. Miscellaneous chemical processes and plastics and plastics machinery (4s.).

FIAT 743. "K-3" silicon dioxide for rubber filler (1s. 6d.).

FIAT 746. Synthetic mica research (2s.).

FIAT 773. Titanium products in Germany (5s. 6d.).

FIAT 774. Anhydrous chlorides manufacture (3s.).

FIAT 803. Kyanite and synthetic sillimanite in Germany: Raw materials used in the manufacture of refractories (1s.).

FIAT 822. Electrolytic mercury oxide at Burghausen (6d.).

FIAT 833. *I.G. Farbenindustrie, Oppau*: Experimental production of chlorine by oxidation of hydrogen chloride (2s.).

FIAT 836. *I.G. Farbenindustrie*: Production of acrylonitrile in the plants at Ludwigshafen, Huels, and Leverkusen (2s.).

FIAT 855. Manufacture of acetaldehyde in Germany (2s. 6d.).

FIAT 860. Production of mono-vinyl-acetate (3s. 6d.).

FIAT 881. Contribution to the production of cast nickel anodes (2s.).

FIAT 889. Urea manufacture at the I.G. Farbenindustrie plant at Oppau (3s.).

FIAT 914. Manufacture of bromallyated barbiturates (2s.).

FIAT 916. English translation of "Studies of Co-Polymers and ingredients for Co-Polymerisation" (1s. 6d.).

The following evaluation report is also available:

BIOS E/B 393. (a) *Hueck and Buren, Hueck and Roepke*; (b) *Vereinigte Deutsche Metallwerke A.G., Werdohl i-M.*; (c) *Sundwiger Messingwerk Sundwig, i.W.*; (d) *Messingwerk Unna A.G.*: Extruding and rolling of zinc alloys (2d.).

Two men were fatally gassed while working in the gas cleansing plant of Messrs. William Dixon Ltd., of Crown Street, Glasgow.

Patents in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted may be obtained from the Patent Office, Southampton Buildings, London, W.C.2., at 1s. each. Numbers given under "Applications for Patents" are for reference in all correspondence up to acceptance of the complete specification.

Applications for Patents

Coating compositions.—E.I. Du Pont de Nemours & Co. 38024.

Purification of water.—Etablissements Phillips et Pain. 37780.

Water softening.—Etablissements Phillips et Pain. 37781.

Dyeing process.—A. S. Fern, and I.C.I., Ltd. 38023.

Toluenesulphonates.—General Aniline & Film Corporation. 37745.

Dyes. General Aniline & Film Corporation. 37748.

Halogenated fluorescein compositions.—S. Gottfried. 37886.

Organic materials.—R. Hammond, and I.C.I., Ltd. 38021.

Dyestuffs.—R. M. Hughes. (J. R. Geigy A.G.) 37809.

Treatment of gases.—J. King, and J. E. Wakeford. 38038.

Moulding of plastics.—V. Lefebure. 37885.

Separating alkaline salts.—London Pharmaceutical Laboratories, Ltd., and G. T. B. Frost. 37991.

Metal bonding process.—Mallory Metallurgical Products, Ltd. 37678.

Lignin products.—Mead Corporation. 37855.

Solid particles.—N.V. de Bataafsche Petroleum Maatschappij. 37793.

Aluminium.—Norske A/S for Elektrokemisk Industri. 37987.

Carbonators.—C. V. di. Pietro. 37848.

Fractionation of tall oil.—Pittsburgh Plate Glass Co. 38014.

Benzylamine.—R. F. Reed, Ltd., and S. G. Long. 38073.

Treatment of aluminium sheets.—Reynolds Metals Co. 37746-7.

Moulding of plastics.—H. Shaw. 37690.

Melting furnaces.—Sklenar Patent Melting Furnaces, Ltd., and W. Williams. 37931.

Biguanide compounds.—Soc. des Usines Chimiques Rhône-Poulenc. 37775.

Plastic moulding.—C. B. Sroka. 37925.

Fertilisers.—Sturtevant Engineering Co., Ltd., H. Richardson & Co. (York), Ltd., J. T. Procter, and A. Ogilvie. 37691.

Synthesis catalysts.—Texaco Development Corporation. 38010.

Purification of sulphur.—R. Walker, C. R. Wilkin, H. G. Cooper, and J. T. Brown. 38005.

Complete Specifications Open to Public Inspection

Beta-halo acyl halides.—B. F. Goodrich Co. June 30, 1945. 15532/46.

Separation of substances of different densities, in particular coal, ore and the like.—E. Harvengt. June 25, 1945. 18971/46.

Fluoro-chloro compounds.—Kinetic chemicals, Inc. June 23, 1945. 17707-8.

Esters of salicyclic acid.—E. Lilly & Co. June 30, 1945. 16248/46.

Substituted benzoic acid esters and salts. thereof.—E. Lilly & Co. June 30, 1945. 16517/46.

Substituted esters of benzoic acid.—E. Lilly & Co. June 30, 1945. 17221-2/46.

Chemical process.—Merck & Co., Inc. June 23, 1945. 17671/46.

Chemical compounds and processes for preparing the same.—Merck & Co., Inc. June 23, 1945. 17672/46.

Chemical compounds and processes for preparing the same.—Merck & Co., Inc. June 23, 1945. 17673/46.

Alloys.—New Jersey Zinc Co. July 20, 1944. 11024/45.

Manufacturing ceramic articles.—R. Pollak. June 30, 1945. 19019/46.

Amino substituted 2-alkyloxy, 5-aminopyridine.—Pyridium Corporation. June 29, 1945. 15392-3/46.

Automatic regulation of the alluvial action in coal and ore washeries operating by shoots.—Rheo-France, Compagnie International des Rheo-Laveurs a France Soc. Anon. June 28, 1945. 19093/46.

Polyvinyl resin compositions.—Soc. des Usines Chimiques Rhône-Poulenc. June 26, 1945. 16510/46.

Azo dyestuffs.—Soc. of Chemical Industry in Basle. Jan. 26, 1944. 1903-4/45.

Production of thiophene.—Socony-Vacuum Oil Co., Inc. June 27, 1945. 32265/45.

Alkyl derivatives of thiophene.—Socony-Vacuum Oil Co., Inc. June 27, 1945. 32305/45.

Coatings or coverings having a basis of super-polyamides.—Soc. Rhodiaceta. May 16, 1942. 35286/45.

Contacting subdivided solids with gaseous fluids.—Standard Oil Development Co. Sept. 12, 1941. 15308/42.

Uniform dyeing of cellulose acetate.—Textron, Inc. June 23, 1945. 18423/46.

Cellulosic fibres.—United States Rubber Co. June 22, 1945. 8095/46.

U.S. Steel Plant Sold

The United States Government steel plant, South Chicago, Ill., was sold to the Republic Steel Corporation for $35,000,000. The plant is the second largest built by the United States. Only the Geneva plant, sold to United States Steel, is larger among Government constructed plants.

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The person appointed will be required to pass a medical examination.

Applications, stating age, qualifications and details of experience accompanied by copies of not more than three recent testimonials must be addressed to the undersigned, the envelope being endorsed " Technical Assistant " so as to reach me not later than the 8th March, 1947.

Canvassing either directly or indirectly will lead to disqualification.

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Clerk of the Council.

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RUBBER and Plastics Manufacturer, London area, require Chief Chemist. First class technical and scientific qualifications, and extensive practical experience necessary, including experience as Chief Chemist in similar organisation. Commencing salary £1,000 p.a. dependant on qualifications. Box No. 2428, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

TECHNICAL Translator. A vacancy occurs with one of the leading Swiss Dyestuff and Chemical Manufacturers for a Technical Translator. Applicants with at least B.Sc., or similar standard, and willing to reside in Switzerland should apply giving details of past experience, age, salary required to Box 2429, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

WANTED, Export Manager, experienced in chemical and essential oil trade. Box No. 2427, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

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VACUUM PUMP by Pears; vertical single cylinder, 6 in. dia. by 6 in. stroke, belt drive.

TWO—**VACUUM PUMPING SETS**, each comprising Worthington Simpson air-cooled vacuum pump with two inclined cylinders; 550 r.p.m., overhung flywheel pulley grooved to receive three Vee ropes and arranged drive through Vee ropes, each with 2 h.p. S.C. motor by B.T.H., 400 volts, 3-phase, 50 cycles, 1,425 r.p.m.

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Single-cylinder Horizontal **SPIRIT PUMP** by Lee Howl; 6 in. by 9 in. by 12 in., with 4 in. suction and delivery; steam driven.

TWO—Electrically-driven 4 in. Lead-lined **CENTRIFUGAL PUMPS** by Kestner; 4 in. suction and delivery; direct coupled to 12½ h.p. motors, 400 volts, 3-phase, 50 cycles, by Laurence Scott, 1,950 r.p.m.

THREE—1½ in. Douglas **CONCENTRIC SPIRIT PUMPS**, each arranged Vee drive from 1½ h.p. Crompton " Klosd " squirrel-cage motor, 400 volts, 3-phase, 50 cycles, 725 r.p.m., with starter.

VACUUM OVEN or STERILISING RETORT, complete with hinged doors at either end, closed by swing bolts and complete with two drying trolleys.

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KIBBLING MACHINE, double rolls 8 in. dia. by 30 in. double geared feed hopper, fast and loose pulleys, balance wheel. Price £95 with spares. **Thom son & Son (Millwall), Ltd.**, Cuba Street, Millwall, London, E.14

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FIVE—New and unused Alfa Laval Centrifugal Separator, type 3024, complete with spares, etc.; motors wound 215 volts D.C.

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ONE—Vertical Air Receiver, 6 ft. dia. by 6 ft. deep; dished ends ½ in. plate; riveted construction; 100 lb. per sq. in. w.p.

ONE—Vertical Air Receiver, 3 ft. 9 in. dia. by 5ft. high by *a* in. riveted plate; 100 lb. per sq. in. w.p.

ONE—Vertical Air Receiver, 2 ft. 6 in. high by 2 ft. dia.; 100 lb. per sq. in. w.p.

ONE—Welded Steam-jacketed Boiling Pan, 2 ft. 4 in. dia. by 2 ft. 4 in. deep; 40 lb. per sq. in. w.p.

ONE—Welded Steam-jacketed Boiling Pan, 2 ft. dia. by 2 ft deep.

THREE—Welded Enclosed Rectangular Storage Tanks, 1,100 galls. capacity, 7 ft. by 5 ft. by 5 ft.

ONE—Welded Enclosed Rectangular Storage Tank, 500 galls. capacity, 7 ft. by 4 ft. by 3 ft.

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ONE—All-electric "STREAMLINE" Oil Filtering Plant, type 08L, 230 volts, 1-phase, 50 cycles supply. New condition.

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ONE—4 in. Centrifugal Pump by Pulsometer, mounted on cast-iron bedplate, pulley drive.

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(1) 125 gall. capacity Stainless Steel Steam-jacketed Hand-tilting Mixer by Adlam, Bristol; pan, 3 ft. 6 in. dia. by 2 ft. 6 in. deep with dished bottom; stainless steel stirring gear. As new.

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Small Jacketed Filter Press
Wood Filter Press, 24 in. by 28 in.
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expected, recorded sharp declines on balance. British Funds participated in the downward movement, led by 2½ per cent. Consols; but, on the other hand, there was a slightly better tendency in nationalisation stocks, electric supply and home rails improving, the latter on further consideration of the L.M.S. dividend statement. Colliery shares recorded only moderate declines, but iron and steels showed a fairly sharp reaction.

Earlier in the week Imperial Chemical, reflecting the general trend, came back from from 44s. 1½d. to 42s. Turner & Newall declined from 88s. 6d. to 86s. 3d., United Molasses from 56s. to 54s. 6d., and Lever & Unilever from 52s. 6d. to 51s. 3d. The market was depressed by the difficulty of assessing the extent to which individual companies would be affected by the "cuts" in production resulting from the fuel crisis; and at the outset prices were marked down indescriminately. Subsequently, some of the heavy declines attracted buying interests on yield considerations. Imperial Chemical at 42s., for instance, yield over 3½ per cent on the basis of the 8 per cent. dividend which has ruled over a long period of years. There is now less hopefulness of an increased dividend for the past year, but even so it is generally felt there is every reason to assume that the 8 per cent. rate will at least be maintained. Associated Cement receded to 63s. 9d., Dunlops declined from 72s. 9d. to 71s. 1½d., English Electric from 62s. 9d. to 61s. 3d., and General Electric from 98s. 3d. to 95s.

Among iron and steels, Guest Keen receded from 46s. 1½d. to 45s., Dorman Long from 26s. 6d. to 25s. 9d., Stewarts and Lloyds from 57s. 9d to 55s. 6d., and United Steel from 25s. 4½d. to 24s. 9d. Powell Duffryn went back from 26s. 1½d. to 25s. 9d., and Staveley from 57s. to 56s. 6d., the reaction in colliery shares being relatively small. Borax Consolidated deferred, despite the excellent impression created by the financial results, were lower at 50s. 3d. British Aluminium at 45s. 3d. showed little movement on balance, but British Oxygen declined from 96s. 3d. to 93s. 9d., and British Plaster Board fell back from 32s. 7½d. to 31s. 6d. The units of the Distillers Co. reflected the general trend, being 133s. 9d., against 135s. 6d. and among plastics De La Rue were ¼ down at 14¾.

There was a fair amount of activity around 50s. in Blythe Colour Works 4s. ordinary shares, which were favoured on current dividend estimates. Business at 12s. 9d. was recorded in Greeff-Chemicals Holdings 5s. ordinary, Morgan Crucible were 58s. 9d., and Stevenson & Howell 5s. ordinary 31s. A weak feature was provided by Metal Box shares, which were marked down 10s. to 103s. 1½d. on the effects of the fuel crisis; but, as in many other directions, though few buyers were in evidence, the fall in prices led to no heavy selling. In other directions, Boots Drug were lowered from 64s. 4½d. to 63s. 1½d. earlier in the week and Beechams deferred from 27s. 7½d. to 27s. Paint shares were also lower, Lewis Berger losing ½ at £8, while International Paint declined ⅛ to £7¼. There was little business in oil shares, price movements being small, though against holders, Shell moved back to 97s. 6d and Burmah to 71s. 3d.

British Chemical Prices

Market Reports

THE market generally is overshadowed by the fuel emergency and its effect on the already tight supply position. Contract deliveries are being maintained wherever possible, but the dislocation in raw material supplies, as a result of reduced production in the non-priority sections of the industry, must inevitably prolong the difficulties of the consuming industries for a considerable time. Prices are very firm and the tendency is towards higher levels. An advance in the controlled rates for bichromates is reported, although details are not yet available. Apart from the influence of present conditions, there is little of interest to report on the coal tar products market.

MANCHESTER.—It is as yet difficult to estimate the full effect of the electricity cut on both production and consumption of chemical products in the Lancashire area, but there is no doubt that it has been very serious and the most that is hoped for is that the restrictions will continue only for a few days. There has, however, been fresh inquiry on the Manchester market during the past week for textile and other chemicals for home consumption, as well as from shippers, but, in consequence of the current supply position of some of the alkalis and other products, firm business on export account is not easy to arrange. Certain sections of the tar products trade have also been affected from a production point of view.

GLASGOW.—In spite of serious restrictions on trading experienced in Scotland, in common with the rest of the country, due to fuel shortage and bad weather conditions, fairly active conditions have prevailed during the week. Orders placed have been well up to standard, although in many cases deliveries are very slow. Prices show every sign of remaining firm, or even increasing. In the export market, business has been received for such chemicals as magnesium carbonate, talc, precipitated chalk, soda crystals, caustic soda, dextrine, tar products, Glauber and Epsom salts, but here deliveries are subject to ability of manufacturers to supply and the shortage of shipping space.

German Technical Reports

Latest Publications

LATEST technical reports from the Intelligence Committee in Germany include the following, copies of which are obtainable from H.M. Stationery Office at the prices stated.

BIOS 229. Wrought light alloy plants in Southern Germany (6s.).

BIOS 696. Manufacture of phosphate esters at Bitterfeld (2s.).

BIOS 731. Manufacture of carbon tetrachloride at *I.G. Farben, Bitterfeld* (4s.).

BIOS 860. Iron powder. Notes on German production methods at *Duesseldorfer Eisenhuettengesellschaft,* and *Deutsche Eisenwerke* (2s.).

BIOS 873. By-product ammonia recovery (1s. 6d.).

BIOS 875. *I.G. Farbenindustrie A.G., Uerdingen*: Phthalic anhydride plant (1s.).

BIOS 876. *I.G., Oppau*: Coke-oven gas separation by Linde (6d.).

BIOS 882. Aluminium foil production (3s.).

BIOS 896. Manufacture of zirconium-potassium fluoride, zirconium oxide and zirconium oxychloride (6d.).

BIOS 908. Manufacture of products from powdered metals (2s.).

BIOS 926. Interrogation of Dr. Eisenmann, of *Dynamit A.G., Troisdorf,* at Beltane Schools, S.W.19: Moulding powders and laminated sheet (1s.).

BIOS 930. *Duisberg Kupfer Huette, Duisberg*: Preparation of zinc by electrolysis)1s. 6d.).

BIOS 935. *I.G. Farbenindustrie, Ludwigshafen am Rhein*: Manufacture of phthalic anhydride (1s.).

BIOS 937. Dr. F. Raschig, G.m.b.H., Ludwigshafen am Rhein, tar products (1s.).

BIOS 939. *I.G. Farbenindustrie, Leverkusen*: Manufacture of synthetic phenol, resorcinol, pure anthracene and pure carbazole (2s. 6d.).

BIOS 953. *I.G. Farbenindustrie, Leverkusen*: Interrogation of Dr. Roelig: Corrosion-preventing coatings of Buna S-ebonite (1s. 6d.).

BIOS 957. Developments in rheolaveur through washing in Belgium: Coal washing (3s. 6d.).

BIOS 962. Production of tungsten wire and processing of scheelite (4s. 6d.).

BIOS 968. *I.G. Farbenindustrie A.G.*: Plastomers: Notes on testing. Interview with Dr. Stocklin and Dr. Roelig, formerly of the Leverkusen Laboratories (6d.).

BIOS 996. *Stadtgaswerke, Hameln*: Detoxification of town's gas (6d.).

BIOS 988. German dyestuffs and dyestuffs intermediates. Azoic products including naphthols, fast salts, nitrosamines and rapid fast salts, rapidogens (4s.).

BIOS 1000. *Preussag Kaliwerke, Stassfurt*: Potash recovery and bromine manufacture (1s. 6d.).

FIAT 524. Production of aluminium (4s. 6d.).

FIAT 432. Manufacture of refractories and information concerning their use in the iron and steel industry of Western Germany (12s. 6d.).

FIAT 720. German techniques for handling acetylene in chemical operations (11s.).

FIAT 724. Miscellaneous chemical processes and plastics and plastics machinery (4s.).

FIAT 743. "K-3" silicon dioxide for rubber filler (1s. 6d.).

FIAT 746. Synthetic mica research (2s.).

FIAT 773. Titanium products in Germany (5s. 6d.).

FIAT 774. Anhydrous chlorides manufacture (3s.).

FIAT 803. Kyanite and synthetic sillimanite in Germany: Raw materials used in the manufacture of refractories (1s.).

FIAT 822. Electrolytic mercury oxide at Burghausen (6d.).

FIAT 833. *I.G. Farbenindustrie, Oppau*: Experimental production of chlorine by oxidation of hydrogen chloride (2s.).

FIAT 836. *I.G. Farbenindustrie*: Production of acrylonitrile in the plants at Ludwigshafen, Huels, and Leverkusen (2s.).

FIAT 855. Manufacture of acetaldehyde in Germany (2s. 6d.).

FIAT 860. Production of mono-vinyl-acetate (3s. 6d.).

FIAT 881. Contribution to the production of cast nickel anodes (2s.).

FIAT 889. Urea manufacture at the I.G. Farbenindustrie plant at Oppau (3s.).

FIAT 914. Manufacture of bromallyated barbiturates (2s.).

FIAT 916. English translation of "Studies of Co-Polymers and ingredients for Co-Polymerisation" (1s. 6d.).

The following evaluation report is also available:

BIOS E/B 393. (a) *Hueck and Ruren, Hueck and Roepke*; (b) *Vereinigte Deutsche Metallwerke A.G., Werdohl i-M.*; (c) *Sundwiger Messingwerk Sundwig, i.W.*; (d) *Messingwerk Unna A.G.*: Extruding and rolling of zinc alloys (2d.).

Two men were fatally gassed while working in the gas cleansing plant of Messrs. William Dixon Ltd., of Crown Street, Glasgow.

Patents in the Chemical Industry

The following information is prepared from the Official Patents Journal. Printed copies of specifications accepted may be obtained from the Patent Office, Southampton Buildings, London, W.C.2., at 1s. each. Numbers given under "Applications for Patents" are for reference in all correspondence up to acceptance of the complete specification.

Applications for Patents

Coating compositions.—E.I. Du Pont de Nemours & Co. 38024.

Purification of water.—Etablissements Phillips et Pain. 37780.

Water softening.—Etablissements Phillips et Pain. 37781.

Dyeing process.—A. S. Fern, and I.C.I., Ltd. 38023.

Toluenesulphonates.—General Aniline & Film Corporation. 37745.

Dyes. General Aniline & Film Corporation. 37748.

Halogenated fluorescein compositions.—S. Gottfried. 37886.

Organic materials.—R. Hammond, and I.C.I., Ltd. 38021.

Dyestuffs.—R. M. Hughes. (J. R. Geigy A.G.) 37809.

Treatment of gases.—J. King, and J. E. Wakeford. 38038.

Moulding of plastics.—V. Lefebure. 37885.

Separating alkaline salts.—London Pharmaceutical Laboratories, Ltd., and G. T. B. Frost. 37991.

Metal bonding process.—Mallory Metallurgical Products, Ltd. 37678.

Lignin products.—Mead Corporation. 37855.

Solid particles.—N.V. de Bataafsche Petroleum Maatschappij. 37793.

Aluminium.—Norske A/S for Elektrokemisk Industri. 37987.

Carbonators.—C. V. di. Pietro. 37848.

Fractionation of tall oil.—Pittsburgh Plate Glass Co. 38014.

Benzylamine.—R. F. Reed, Ltd., and S. G. Long. 38073.

Treatment of aluminium sheets.—Reynolds Metals Co. 37746-7.

Moulding of plastics.—H. Shaw. 37690.

Melting furnaces.—Sklenar Patent Melting Furnaces, Ltd., and W. Williams. 37931.

Biguanide compounds.—Soc. des Usines Chimiques Rhône-Poulenc. 37775.

Plastic moulding.—C. B. Sroka. 37925.

Fertilisers.—Sturtevant Engineering Co., Ltd., H. Richardson & Co. (York), Ltd., J. T. Procter, and A. Ogilvie. 37691.

Synthesis catalysts.—Texaco Development Corporation. 38010.

Purification of sulphur.—R. Walker, C. R. Wilkin, H. G. Cooper, and J. T. Brown. 38005.

Complete Specifications Open to Public Inspection

Beta-halo acyl halides.—B. F. Goodrich Co. June 30, 1945. 15532/46.

Separation of substances of different densities, in particular coal, ore and the like.—E. Harvengt. June 25, 1945. 18971/46.

Fluoro-chloro compounds.—Kinetic chemicals, Inc. June 23, 1945. 17707-8.

Esters of salicyclic acid.—E. Lilly & Co. June 30, 1945. 16248/46.

Substituted benzoic acid esters and salts thereof.—E. Lilly & Co. June 30, 1945. 16517/46.

Substituted esters of benzoic acid.—E. Lilly & Co. June 30, 1945. 17221-2/46.

Chemical process.—Merck & Co., Inc. June 23, 1945. 17671/46.

Chemical compounds and processes for preparing the same.—Merck & Co., Inc. June 23, 1945. 17672/46.

Chemical compounds and processes for preparing the same.—Merck & Co., Inc. June 23, 1945. 17673/46.

Alloys.—New Jersey Zinc Co. July 20, 1944. 11024/45.

Manufacturing ceramic articles.—R. Pollak. June 30, 1945. 19019/46.

Amino substituted 2-alkyloxy, 5-aminopyridine.—Pyridium Corporation. June 29, 1945. 15392-3/46.

Automatic regulation of the alluvial action in coal and ore washeries operating by shoots.—Rheo-France, Compagnie International des Rheo-Laveurs a France Soc. Anon. June 28, 1945. 19093/46.

Polyvinyl resin compositions.—Soc. des Usines Chimiques Rhône-Poulenc. June 26, 1945. 16510/46.

Azo dyestuffs.—Soc. of Chemical Industry in Basle. Jan. 26, 1944. 1903-4/45.

Production of thiophene.—Socony-Vacuum Oil Co., Inc. June 27, 1945. 32265/45.

Alkyl derivatives of thiophene.—Socony-Vacuum Oil Co., Inc. June 27, 1945. 32305/45.

Coatings or coverings having a basis of super-polyamides.—Soc. Rhodiaceta. May 16, 1942. 35286/45.

Contacting subdivided solids with gaseous fluids.—Standard Oil Development Co. Sept. 12, 1941. 15308/42.

Uniform dyeing of cellulose acetate.—Textron, Inc. June 23, 1945. 18433/46.

Cellulosic fibres.—United States Rubber Co. June 22, 1945. 8095/46.

U.S. Steel Plant Sold

The United States Government steel plant, South Chicago, Ill., was sold to the Republic Steel Corporation for $35,000,000. The plant is the second largest built by the United States. Only the Geneva plant, sold to United States Steel, is larger among Government constructed plants.

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The officer appointed will be required, under the general direction of the Central Purchasing Officer, to be responsible for the testing of the various commodities purchased, and to assist in the formulation of specifications and other technical matters.

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Salary on National Scale Grade V (£460 × £15/£20–£510 per annum), plus London Weighting Allowance of £20, the commencing salary depending upon the qualifications and experience of the person appointed. In addition, war bonus at present approximately £60 per annum, is payable.

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Applications, stating age, qualifications and details of experience accompanied by copies of not more than three recent testimonials must be addressed to the undersigned, the envelope being endorsed " Technical Assistant " so as to reach me not later than the 8th March, 1947.

Canvassing either directly or indirectly will lead to disqualification.

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RUBBER and Plastics Manufacturer, London area, require Chief Chemist. First class technical and scientific qualifications, and extensive practical experience necessary, including experience as Chief Chemist in similar organisation. Commencing salary £1,000 p.a. dependant on qualifications. Box No. 2428, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

TECHNICAL Translator. A vacancy occurs with one of the leading Swiss Dyestuff and Chemical Manufacturers for a Technical Translator. Applicants with at least B.Sc., or similar standard, and willing to reside in Switzerland should apply giving details of past experience, age, salary required to Box 2429, THE CHEMICAL AGE, 154, Fleet Street, London, E.C.4.

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Single-cylinder Horizontal **SPIRIT PUMP** by Lee Howl ; 6 in. by 9 in. by 12 in., with 4 in. suction and delivery ; steam driven.

TWO—Electrically-driven 4 in. Lead-lined **CENTRIFUGAL PUMPS** by Kestner ; 4 in. suction and delivery ; direct coupled to 12½ h.p. motors, 400 volts, 3-phase, 50 cycles, by Laurence Scott, 1,950 r.p.m.

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ONE—Vertical Open-top Underdriven M.S. Mixing Pan for heavy materials, 4 ft. 6 in. dia. by 2 ft. 3 in. deep.

ONE—Vertical Air Receiver, 6 ft. dia. by 6 ft. deep; dished ends ½ in. plate; riveted construction; 100 lb. per sq. in. w.p.

ONE—Vertical Air Receiver, 3 ft. 9 in. dia. by 5ft. high by *a* in. riveted plate; 100 lb. per sq. in. w.p.

ONE—Vertical Air Receiver, 2 ft. 6 in. high by 2 ft. dia.; 100 lb. per sq. in. w.p.

ONE—Welded Steam-jacketed Boiling Pan, 2 ft. 4 in. dia. by 2 ft. 4 in. deep; 40 lb. per sq. in. w.p.

ONE—Welded Steam-jacketed Boiling Pan, 2 ft. dia. by 2 ft deep.

THREE—Welded Enclosed Rectangular Storage Tanks, 1,100 galls. capacity, 7 ft. by 5 ft. by 5 ft.

ONE—Welded Enclosed Rectangular Storage Tank, 500 galls. capacity, 7 ft. by 4 ft. by 3 ft.

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ONE—All-electric "STREAMLINE" Oil Filtering Plant, type 08L, 230 volts, 1-phase, 50 cycles supply. New condition.

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